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Washington Basin Outlook Report June 1, 2000

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Basin Outlook Reports and Federal - State - Private Cooperative Snow Surveys

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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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Washington Water Supply Outlook

June 2000

General Outlook

The month of May was considerably wetter and cooler than the previous month. These conditions helped slow upper elevation snow melt and are the reason for reported increases in snow-water-content in many basins. Every telemetered site in Washington is loosing snowpack, however many ended the season with above average accumulations and is melting slower than normal. The Snow Survey staff, in cooperation with Asotin County and Seattle City Light, is planning for the installation of four new SNOTEL sites in Washington this summer. These new sites will be used for improving streamflow forecasting, resource management and early flood warning. Also, please take a look at the Glacier Research Page (colored insert) at the back of this report.

Snowpack

The June 1 statewide SNOTEL readings remained above average at 111%. Cooler temperatures have helped curtail a rapid spring melt. Among the basins with remaining measurable snowpack the Walla Walla River Basin reported the lowest readings at 36% of average. Readings taken in the Lewis River Basin reported the highest at 422% of average. Westside averages from SNOTEL and June 1 snow surveys included the North Puget Sound river basins with 84%, the Central Puget river basins with 161%, and the Olympic basins with 73%. Snowpack along the east slopes of the Cascade Mountains included the Yakima area with 137% and the Wenatchee area with 104%. Snowpack in the Spokane River Basin was at 61% and the Pend Oreille River Basin, including Canadian data, had 56% of average. Maximum snow cover in Washington was at Paradise Park SNOTEL near Mount Rainer with a water content of 78.1 inches. This site would normally have 48.1 inches of water content on June 1. Last year at this time Paradise Park had 106.7 inches of snow water.

BASIN	PERCENT OF LAST YEAR	PERCENT OF AVERAGE	ONE MONTH CHANGE
Spokane	43	61	-23
Newman Lake	00	00	00
Pend Oreille	39	56	-17
Okanogan	60	120	38
Methow	39	89	6
Wenatchee	38	94	-3
Chelan	48	114	11
Stemilt Creek	00	00	00
Yakima	35	137	30
Ahtanum Creek	00	00	00
Walla Walla	15	36	-42
Lower Snake	31	54	-29
Cowlitz	48	140	21
Lewis	41	422	238
White	46	159	46
Green	40	165	26
Puyallup	46	159	46
Cedar	00	00	00
Snoqualmie	52	153	45
Skykomish	51	151	46
Skagit	40	93	10
Baker	N/A	N/A	N/A
Nooksack	25	75	-24
Olympic Peninsula	16	73	-9

Precipitation

During the month of May, the National Weather Service and Natural Resources Conservation Service climate stations showed a wide variation in average precipitation across the state. The highest percent of average in the state was at Glenwood in Klickitat County. Glenwood reported 257% of average for a total of 1.9 inches. The average for this site is .74 inches for May. Averages for the water year varied from 118% of average in the Walla Walla River Basin to 89% of average in the Okanogan - Methow river basins.

RIVER BASIN	MAY PERCENT OF AVERAGE	WATER YEAR PERCENT OF AVERAGE	ONE MONTH CHANGE
Spokane	105	111	-2
Colville-Pend Oreille	124	108	1
Okanogan-Methow	71	89	-2
Wenatchee-Chelan	113	103	-0
Upper Yakima	114	104	-0
Lower Yakima	94	112	-1
Walla Walla	168	118	2
Lower Snake	79	101	-2
Cowlitz-Lewis	113	107	-1
White-Green-Puyallup	125	99	3
Central Puget Sound	133	110	1
North Puget Sound	137	104	1
Olympic Peninsula	146	111	2

Reservoir

Reservoir storage in the Yakima Basin was 804,200-acre feet, 109% of average for the Upper Reaches and 227,800-acre feet, 117% of average for Rimrock and Bumping Lakes. Storage at the Okanogan reservoirs was 115% of average for June 1. The power generation reservoirs included the following: Coeur d'Alene Lake, 215,500-acre feet, 77% of average and 90% of capacity; Chelan Lake, 457,800-acre feet, 102% of average and 68% of capacity; and Ross Lake at 94% of average and 69% of capacity.

BASIN	PERCENT OF CAPACITY	PERCENT OF AVERAGE
Spokane	90	77
Colville-Pend Oreille	47	85
Okanogan-Methow	88	115
Wenatchee-Chelan	68	102
Upper Yakima	96	109
Lower Yakima	98	117
North Puget Sound	71	95

For more information contact your local Natural Resources Conservation Service office.

Streamflow

June forecasts indicate near normal summer flows for most streams in the state. They vary from 123% of average for Klickitat River near Glenwood to 70% of average for Grande Ronde River at Troy. June forecasts for some Western Washington streams include the Cedar River near Cedar Falls, 94%; Green River, 100%; and Skagit River, 87%. Some Eastern Washington streams include the Yakima River near Parker, 92%; Wenatchee River at Plain, 99%; and Spokane River near Post Falls, 80%. Volumetric forecasts are developed using current, historic and average snowpack, precipitation, streamflow and SOI data collected and coordinated by organizations cooperating with NRCS.

Streamflows reported for May were near to slightly below average. The Lewis River near Ariel had the highest flows with 224% of average. The Methow at Pateros with 77% of average, was the lowest in the state. Other streamflows were the following percentage of average: the Priest River, 105%; the Columbia at The Dalles, 89%; the Spokane at Spokane, 82%; the Columbia below Rock Island Dam, 92%; the Cowlitz at Castle Rock, 94%; and the Snake River below Ice Harbor Dam, 82%.

BASIN	PERCENT OF AVERAGE MOST PROBABLE FORECAST (50 PERCENT CHANCE OF EXCEEDENCE)
-------	---

Spokane	80-83
Colville-Pend Oreille	79-119
Okanogan-Methow	84-100
Wenatchee-Chelan	96-109
Upper Yakima	87-90
Lower Yakima	87-123
Walla Walla	100-105
Lower Snake	70-77
Cowlitz-Lewis	92-128
White-Green-Puyallup	96-100
Central Puget Sound	91-101
North Puget Sound	87-97
Olympic Peninsula	93-98

STREAM	PERCENT OF AVERAGE MAY STREAMFLOWS
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Pend Oreille Below Box Canyon	91
Kettle at Laurier	95
Columbia at Birchbank	91
Spokane at Long Lake	95
Similkameen at Nighthawk	83
Okanogan at Tonasket	92
Methow at Pateros	77
Chelan at Chelan	86
Wenatchee at Pashastin	92
Yakima at Cle Elum	100
Yakima at Parker	90
Naches at Naches	87
Grande Ronde at Troy	83
Snake below Lower Granite Dam	84
SF Walla Walla near Milton Freewater	81
Lewis at Ariel	224
Cowlitz below Mayfield Dam	92
Skagit at Concrete	96

For more information contact your local Natural Resources Conservation Service office.

BASIN SUMMARY OF SNOW COURSE DATA

JUNE 2000

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
ALPINE MEADOWS PILL	3500	6/01/00	---	42.7	45.4	22.7	MOSES MTN PILL	4800	6/01/00	---	.0	1.2	.0
BADGER PASS PILL	6900	6/01/00	---	12.6	36.8	20.9	MOSQUITO RDG PILL	5200	6/01/00	---	11.8	26.9	16.0
BARKER LAKES PILL	8250	6/01/00	---	1.7	13.0	10.0	MOUNT CRAG PILL	4050	6/01/00	11	1.6	10.0	.0
BASIN CREEK PILL	7180	6/01/00	---	.1	5.5	4.7	MT. KOBAN CAN.	5500	5/28/00	4	1.2	17.2	5.0
BEAVER CREEK TRAIL	2200	5/30/00	0	.0	3.6	--	MOUNT GARDNER PILL	2860	6/01/00	---	.0	.1	.0
BEAVER PASS	3680	5/30/00	19	9.3	50.0	--	N.F. ELK CR PILL	6250	6/01/00	---	.5	.0	.9
BIG CREEK	6750	6/01/00	56	27.2	40.6	42.1	NEW HOZOMEEN LAKE	2800	5/30/00	0	.0	.0	--
BIG WHITE MTN CAN.	5510	5/26/00	28	13.0	17.2	7.6	NEZ PERCE CMP PILL	5650	6/01/00	---	.0	.0	.2
BLACK PINE PILL	7100	6/01/00	---	.3	.0	2.4	NOISY BASIN PILL	6040	6/01/00	---	25.8	34.8	30.2
BLEWETT PASS#2PILL	4270	6/01/00	0	.0	.0	.0	NORTH FORK JOCKO	6330	6/01/00	36	17.6	33.2	26.3
BRENDA MINE CAN.	4450	6/01/00	---	.0	--	--	OLALLIE MDWS PILL	3960	6/01/00	---	36.1	81.9	30.0
BROWN TOP AM	6000	6/01/00	94	49.0	92.8	--	PARADISE PARK PILL	5500	6/01/00	---	78.1	106.7	48.1
BUMPING RIDGE PILL	4600	6/01/00	---	12.4	41.7	6.3	PARK CK RIDGE PILL	4600	6/01/00	21	11.7	48.2	5.2
BUNCHGRASS MDWPILL	5000	6/01/00	---	12.9	31.5	15.4	PETERSON MDW PILL	7200	6/01/00	---	.2	5.2	2.7
CHICKEN CREEK	4060	5/31/00	0	.0	.0	.0	PIGTAIL PEAK PILL	5900	6/01/00	88	30.6	79.4	37.5
COMBINATION PILL	5600	6/01/00	---	.0	.0	.0	PIKE CREEK PILL	5930	6/01/00	---	.8	13.8	7.9
COPPER BOTTOM PILL	5200	6/01/00	---	.0	.0	.0	POPE RIDGE PILL	3540	6/01/00	0	.0	.0	.0
CORRAL PASS PILL	6000	6/01/00	---	28.8	49.9	19.6	POTATO HILL PILL	4500	6/01/00	---	6.8	26.2	1.1
COUGAR MTN. PILL	3200	6/01/00	0	.0	12.3	.0	QUARTZ PEAK PILL	4700	6/01/00	---	.0	4.8	.0
DAILY CREEK PILL	5780	6/01/00	---	.0	.0	.0	RAINY PASS PILL	4780	6/01/00	---	18.0	43.9	20.4
DEVILS PARK	5900	6/01/00	61	33.4	62.8	31.8	REX RIVER PILL	1900	6/01/00	6	1.6	21.2	.0
DISCOVERY BASIN	7050	5/30/00	0	.0	1.6	4.2	ROCKER PEAK PILL	8000	6/01/00	---	3.7	12.4	13.2
ELBOW LAKE PILL	3200	6/01/00	25	12.1	45.6	6.1	SADDLE MTN PILL	7900	6/01/00	---	2.8	20.7	17.5
EMERY CREEK PILL	4350	6/01/00	---	.0	.0	.0	SALMON MDWS PILL	4500	6/01/00	---	.0	.0	.0
ENDERBY CAN.	5800	5/28/00	104	50.4	55.5	38.9	SASSE RIDGE PILL	4200	6/01/00	---	2.8	35.0	1.3
FISH LAKE PILL	3370	6/01/00	---	3.3	27.5	5.0	SAVAGE PASS PILL	6170	6/01/00	---	.0	18.1	12.5
FLATTOP MTN PILL	6300	6/01/00	---	30.9	52.7	34.4	SHEEP CANYON PILL	4050	6/01/00	---	26.5	68.4	11.6
FREEZEOUT CK. TRAIL	3500	5/30/00	0	.0	6.0	--	SILVER STAR MTN CAN.	5600	5/29/00	54	28.1	35.7	16.1
FROHNER MDWS PILL	6480	6/01/00	---	.0	.0	1.2	SKALKAHO PILL	7260	6/01/00	---	4.2	18.8	15.8
GRAVE CRK PILL	4300	6/01/00	---	.0	.0	.0	SKOOKUM CREEK PILL	3920	6/01/00	---	.0	22.9	.0
GREEN LAKE PILL	6000	6/01/00	---	.3	21.6	3.8	SPENCER MDW PILL	3400	6/01/00	---	4.2	46.6	.0
GROUSE CAMP PILL	5380	6/01/00	---	.0	3.3	.0	SPIRIT LAKE PILL	3100	6/01/00	---	.0	.0	.0
HAND CREEK PILL	5030	6/01/00	---	.0	.0	.0	STAHL PEAK PILL	6030	6/01/00	---	23.7	40.0	27.3
HARTS PASS PILL	6500	6/01/00	---	22.5	61.2	25.3	STAMPEDE PASS PILL	3860	6/01/00	---	24.7	49.6	15.0
HELL ROARING DIVIDE	5770	6/01/00	24	11.4	19.6	11.2	STEVENS PASS PILL	4070	6/01/00	---	7.4	31.8	5.7
HERRIG JUNCTION	4850	5/30/00	0	.0	16.0	2.4	STEVENS PASS SAND SD	3700	5/30/00	7	3.8	28.7	9.7
HIGH RIDGE PILL	4980	6/01/00	---	1.4	.0	.6	STRYKER BASIN	6180	5/31/00	31	15.2	31.0	20.6
HOODOO BASIN PILL	6050	6/01/00	---	20.4	49.3	29.2	STUART MOUNTAIN	7400	6/01/00	20	8.2	--	--
HUMBOLDT GLCH PILL	4250	6/01/00	---	.0	.0	.0	SUNSET PILL	5540	6/01/00	---	.0	9.2	12.5
JUNE LAKE PILL	3200	6/01/00	---	29.1	60.6	.0	SURPRISE LKS PILL	4250	6/01/00	---	37.4	65.8	14.5
KRAFT CREEK PILL	4750	6/01/00	---	.0	.0	.0	THUNDER BASIN	4200	5/30/00	20	7.6	34.6	10.0
LOLO PASS PILL	5240	6/01/00	---	.0	19.6	.0	TINKHAM CREEK PILL	3000	6/01/00	---	.1	.0	.0
LONE PINE PILL	3800	6/01/00	---	30.2	75.8	9.4	TOUCHET #2 PILL	5530	6/01/00	---	1.3	18.4	.0
LOOKOUT PILL	5140	6/01/00	---	6.6	22.7	10.0	TROUGH #2 PILL	5310	6/01/00	---	.0	.0	6.0
LOST HORSE PILL	5000	6/01/00	---	.0	3.5	.0	TV MOUNTAIN	6800	6/01/00	2	.5	--	--
LOST LAKE PILL	6110	6/01/00	---	33.8	58.5	46.8	TWELVEMILE PILL	5600	6/01/00	---	.0	.0	.6
LUBRECHT PILL	4680	6/01/00	---	.1	.0	.0	TWIN LAKES PILL	6400	6/01/00	---	6.3	36.0	25.8
LYMAN LAKE PILL	5900	6/01/00	---	51.2	86.2	43.3	UPPER WHEELER PILL	4400	6/01/00	---	.0	.0	.0
MEADOWS CABIN	1900	5/30/00	0	.0	.0	--	WARM SPRINGS PILL	7800	6/01/00	---	10.1	19.2	19.6
MEADOWS PASS PILL	3240	6/01/00	---	.0	8.5	.0	WELLS CREEK PILL	4200	6/01/00	---	9.1	40.0	22.2
MICA CREEK PILL	4750	6/01/00	---	.0	1.9	--	WHITE PASS ES PILL	4500	6/01/00	---	2.5	20.6	4.6
MOOSE CREEK PILL	6200	6/01/00	---	.0	.0	.0	WHITE ROCKS MTN CAN.	7200	6/01/00	11	9.3	--	6.6
MORSE LAKE PILL	5400	6/01/00	---	36.2	92.3	21.4							



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Helpful Internet Addresses

NRCS Snow Survey and Climate Services Homepages

Washington:

<http://www.wa.nrcs.usda.gov/snow/snow.htm>

Oregon:

<http://crystal.or.nrcs.usda.gov/snowsveys>

Idaho:

<http://idsnow.id.nrcs.usda.gov>

National Water and Climate Center (NWCC):

<http://www.wcc.nrcs.usda.gov>

NWCC Anonymous FTP Server:

<ftp.wcc.nrcs.usda.gov>

USDA-NRCS Agency Homepages

Washington:

<http://www.wa.nrcs.usda.gov/nrcs>

NRCS National:

<http://www.ftw.nrcs.usda.gov>



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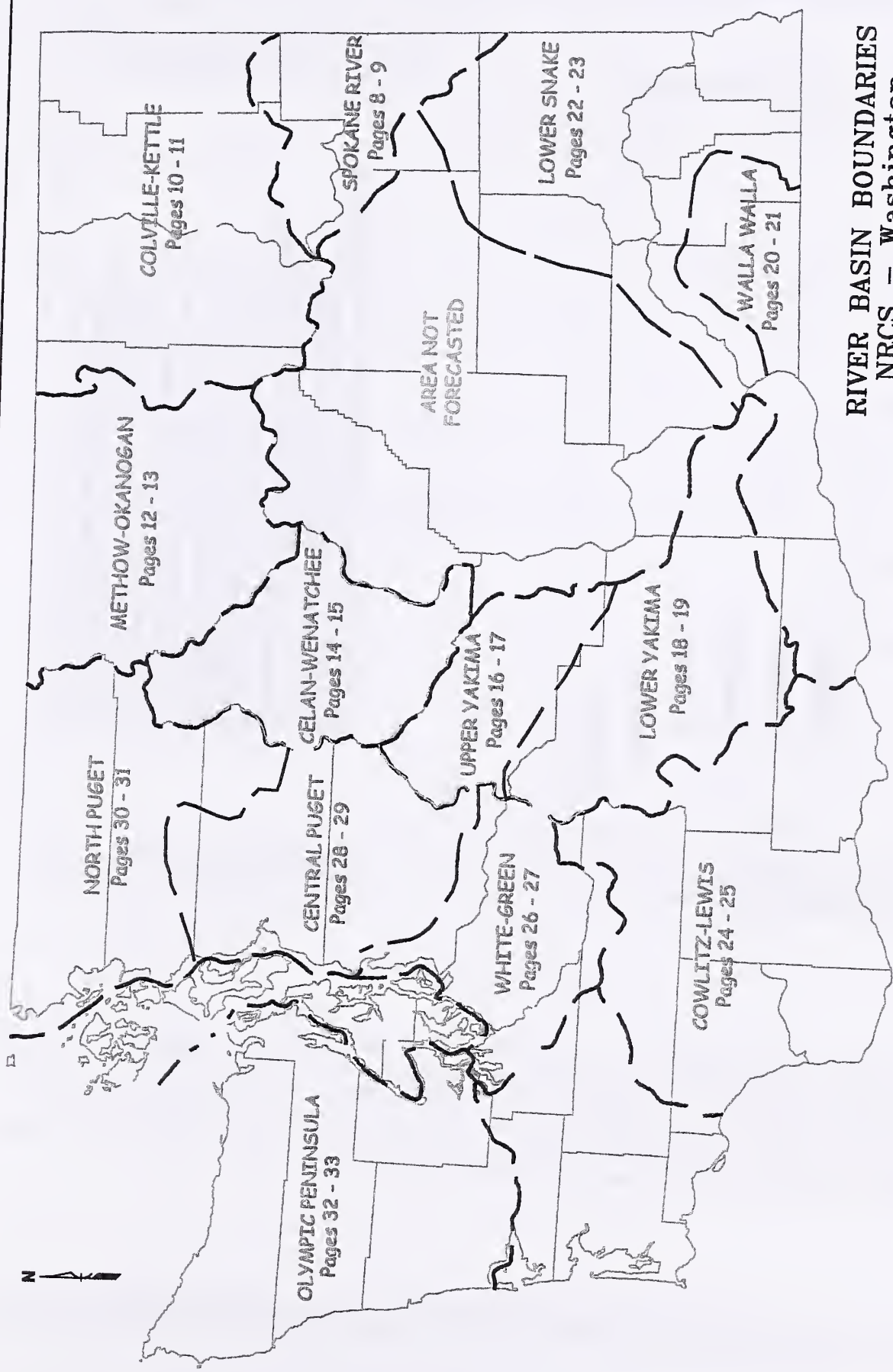
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Data Collection Offices

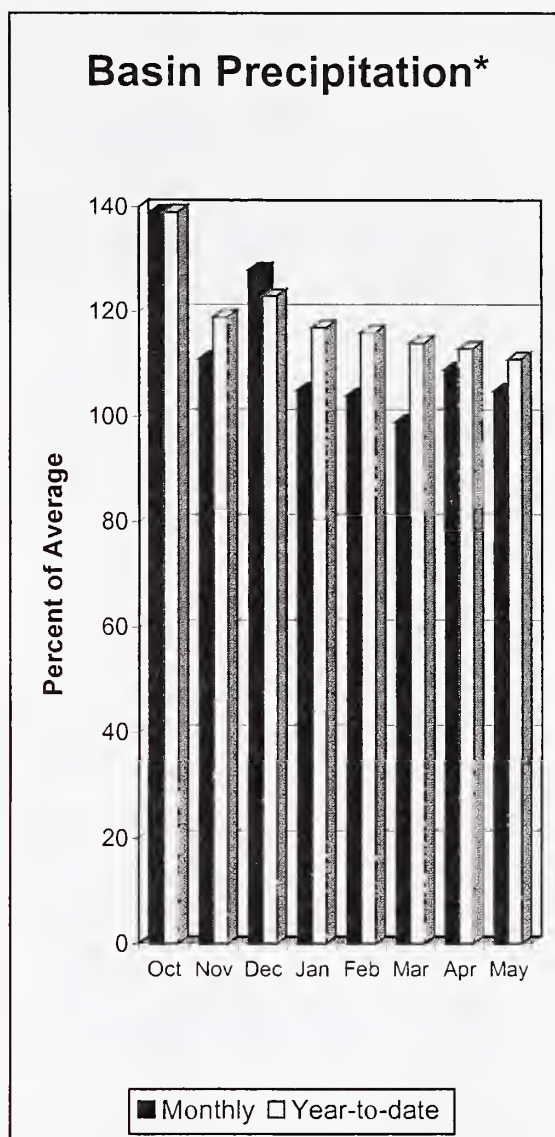
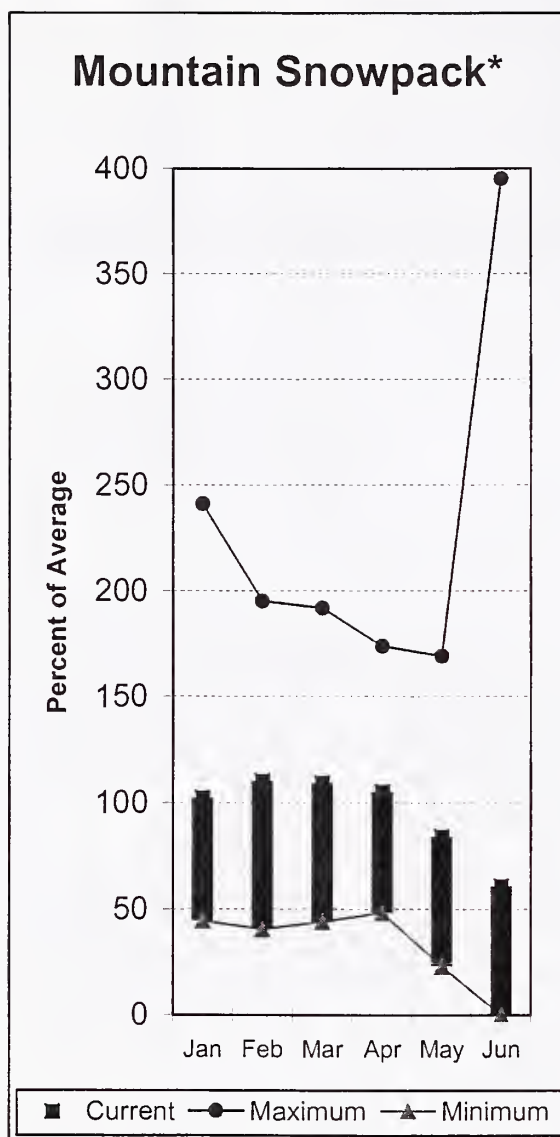
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RIVER BASIN BOUNDARIES
NRCS - Washington
2000

Spokane River Basin



*Based on selected stations

The June 1 forecasts for summer runoff within the Spokane River Basin are 80% of average near Post Falls and 83% at Long Lake. The forecast is based on a basin snowpack that is 61% of average and precipitation that is 111% of average for the water year. Precipitation for May was near normal at 105% of average. Streamflow on the Spokane River at Long Lake, was 95% of average for May. June 1 storage in Coeur d'Alene Lake, was 215,500-acre feet, 77% of average and 90% of capacity. Snowpack at Quartz Peak SNOTEL melted out on May 22nd. Average temperatures in the Spokane basin were near normal.

For more information contact your local Natural Resources Conservation Service office.

Spokane River Basin

Streamflow Forecasts - June 1, 2000

<===== Drier ===== Future Conditions ===== Wetter =====>								
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)	30% (1000AF)	10% (1000AF)		
SPOKANE near Post Falls (2)	JUN-SEP	413	542	629	80	716	845	785
	JUN-JUL	338	459	542	78	625	746	692
SPOKANE at Long Lake	JUN-JUL	476	609	699	81	789	922	859
	JUN-SEP	662	805	902	83	999	1142	1082

SPOKANE RIVER BASIN Reservoir Storage (1000 AF) - End of May					SPOKANE RIVER BASIN Watershed Snowpack Analysis - June 1, 2000			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
COEUR D'ALENE	238.5	215.5	352.5	280.5	SPOKANE RIVER	7	42	61
					NEWMAN LAKE	1	0	0

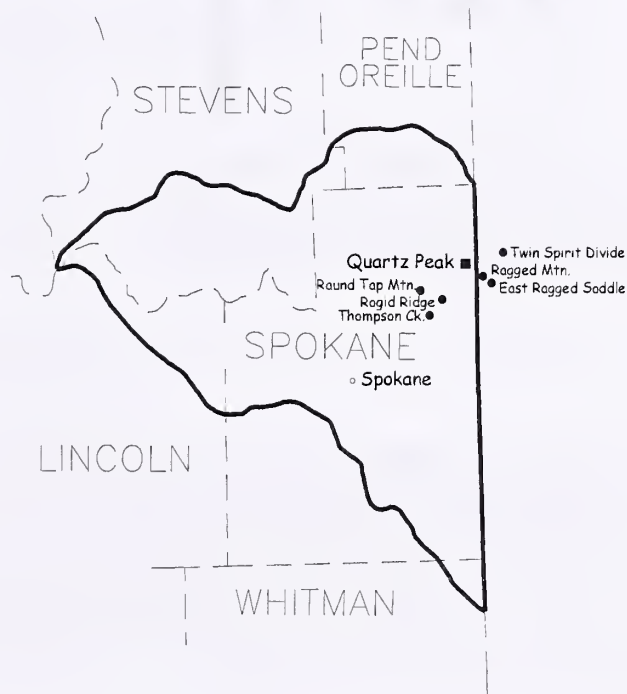
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The average is computed for the 1961-1990 base period.

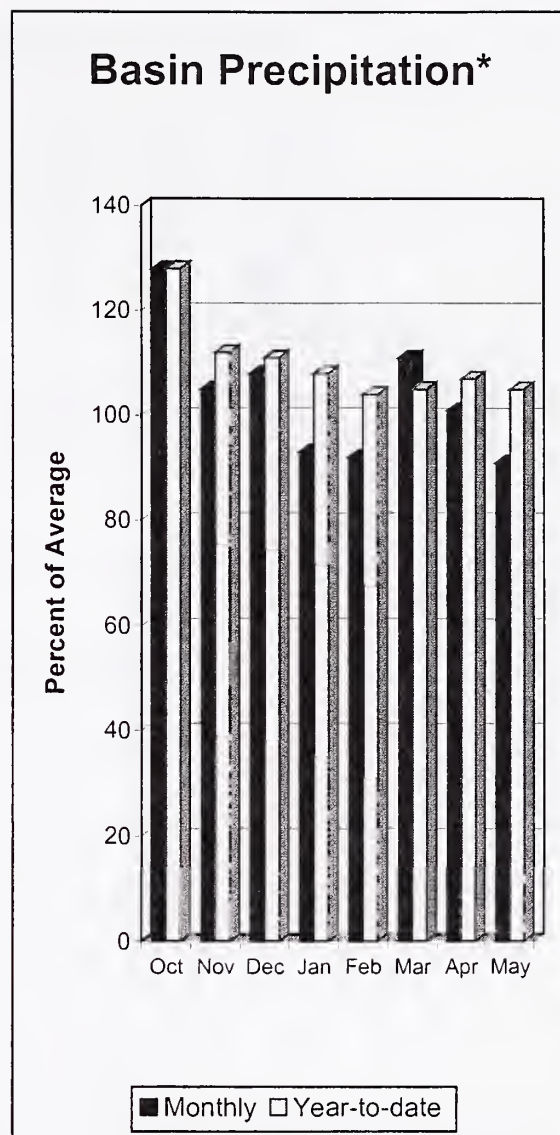
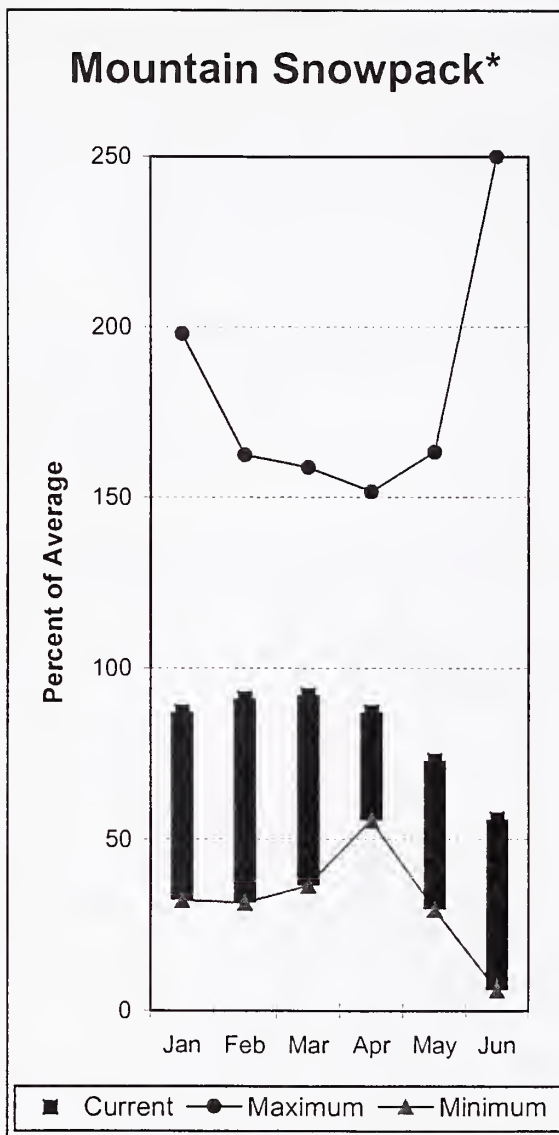
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 (2) - The value is natural flow - actual flow may be affected by upstream water management.

SPOKANE RIVER BASIN Percent of Average June 1, 2000

Snowpack - 61%
 Precipitation - 111%
 Reservoir - 77%



Colville - Pend Oreille River Basins



*Based on selected stations

The June – September average forecast for the Kettle River streamflow is 112%, Colville at Kettle Falls is 110%, Chamokane Creek near Long Lake is 119% and Priest River near the town of Priest River is 107%. May streamflow was 91% of average on the Pend Oreille River, 91% on the Columbia at the International Boundary and 95% on the Kettle River. June 1 snow cover was 56% of average in the Pend Oreille Basin and 171% in the Kettle River Basin. Precipitation during May was 91% of average, bringing the year-to-date precipitation to 105% of average. Reservoir storage in Roosevelt and Banks lakes was reported to be 85% of average and 47% of capacity on June 1. Average temperatures were near normal.

For more information contact your local Natural Resources Conservation Service office.

Colville - Pend Oreille River Basins

Streamflow Forecasts - June 1, 2000

		<<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
PEND OREILLE Lake Inflow (1,2)	JUN-JUL	3337	4456	4964	77	5472	6591	6449
	JUN-SEP	4259	5501	6065	79	6629	7871	7669
PRIEST near Priest (1,2)	JUN-JUL	237	291	315	106	339	393	297
	JUN-SEP	285	347	375	107	403	465	351
PEND OREILLE bl Box Canyon (1,2)	JUN-JUL	2599	4273	5034	77	5795	7469	6543
	JUN-SEP	3444	5297	6139	79	6981	8834	7754
CHAMOKANE CREEK near Long Lake	JUL-AUG	3.34	3.55	3.70	119	3.85	4.06	3.12
COLVILLE at Kettle Falls	JUN-SEP	28	38	45	110	52	63	41
	JUN-JUL	18.2	27	33	110	39	48	30
KETTLE near Laurier	JUN-SEP	749	869	950	112	1031	1151	851
	JUN-JUL	690	785	850	112	915	1010	758

COLVILLE - PEND OREILLE RIVER BASINS Reservoir Storage (1000 AF) - End of May

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
ROOSEVELT	5232.0	2120.5	1706.5	2851.0
BANKS	715.0	671.3	673.0	418.0

COLVILLE - PEND OREILLE RIVER BASINS Watershed Snowpack Analysis - June 1, 2000

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
COLVILLE RIVER	0	0	0
PEND OREILLE RIVER	42	39	56
KETTLE RIVER	1	76	171

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

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(2) - The value is natural flow - actual flow may be affected by upstream water management.

COLVILLE-PEND OREILLE BASIN

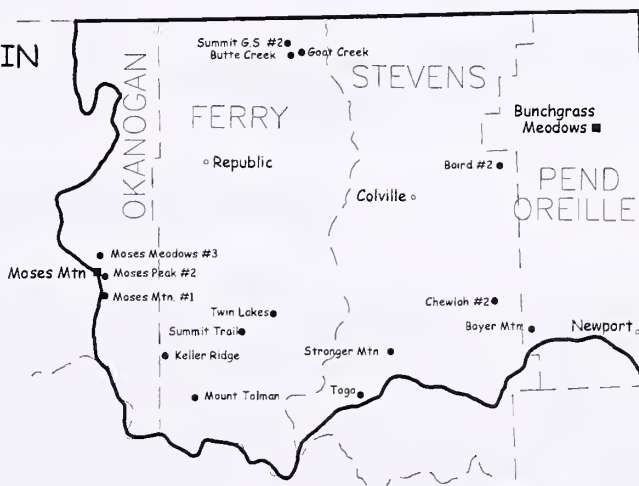
Percent of Average

June 1, 2000

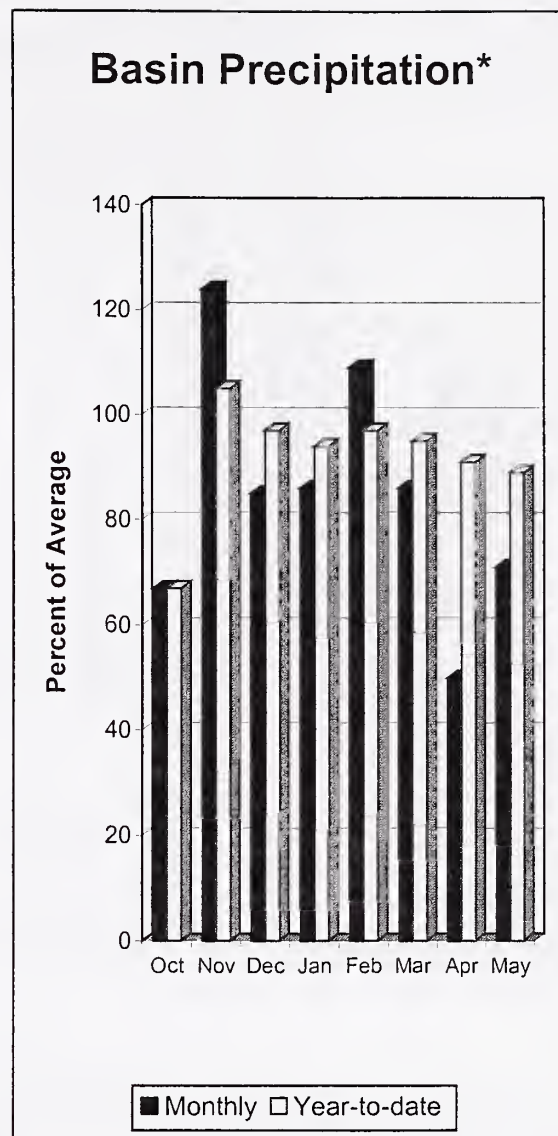
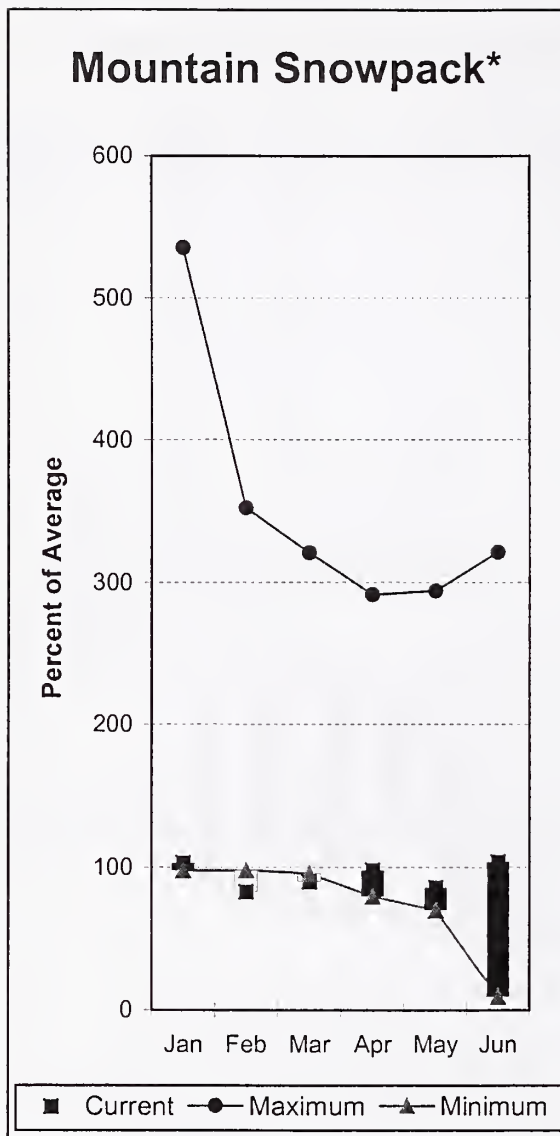
Snowpack - 56%

Precipitation - 105%

Reservoir - 85%



Okanogon - Methow River Basins



*Based on selected stations

Average summer runoff forecast for the Okanogon River is 94%, Similkameen River is 84%, Methow River is 100% and Salmon Creek is 85%. June 1 snow cover on the Okanogon was 120% of average and the Methow was 89%. Moses Mountain SNOTEL site had melted out by June 1. May precipitation in the Okanogon-Methow was 71% of average, with precipitation for the water year at 89% of average. May streamflow for the Methow River was 77% of average, 92% for the Okanogon River and 83% for the Similkameen. Combined storage in the Conconully Reservoirs was 20,700-acre feet, which is 88% of capacity and 115% of the June 1 average. Temperatures were 1 degree above normal for the past month.

For more information contact your local Natural Resources Conservation Service office.

Okanogan - Methow River Basins

Streamflow Forecasts - June 1, 2000

		<<----- Drier ----- Future Conditions ----- Wetter ----->>						
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
SIMILKAMEEN near Nighthawk (1)	JUN-JUL	361	534	612	81	690	863	755
	JUN-SEP	454	630	710	84	790	966	850
OKANOGAN near Tonasket (1)	JUN-JUL	463	679	777	92	875	1091	848
	JUN-SEP	583	828	940	94	1052	1297	1005
SALMON CREEK near Conconully	JUN-JUL	0.87	5.05	7.90	85	10.75	14.93	9.30
	JUN-SEP	1.0	5.6	8.7	85	11.8	16.4	10.2
METHOW RIVER near Pateros	JUN-SEP	437	507	555	100	603	673	555
	JUN-JUL	386	447	488	100	529	590	486

OKANOGAN - METHOW RIVER BASINS Reservoir Storage (1000 AF) - End of May

OKANOGAN - METHOW RIVER BASINS Watershed Snowpack Analysis - June 1, 2000

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
SALMON LAKE		NO REPORT			OKANOGAN RIVER	6	58	121
CONCONULLY RESERVOIR		NO REPORT			OMAK CREEK	1	0	0
					SANPOIL RIVER	0	0	0
					SIMILKAMEEN RIVER	0	0	0
					TOATS COULEE CREEK	0	0	0
					CONCONULLY LAKE	1	0	0
					METHOW RIVER	3	39	89

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

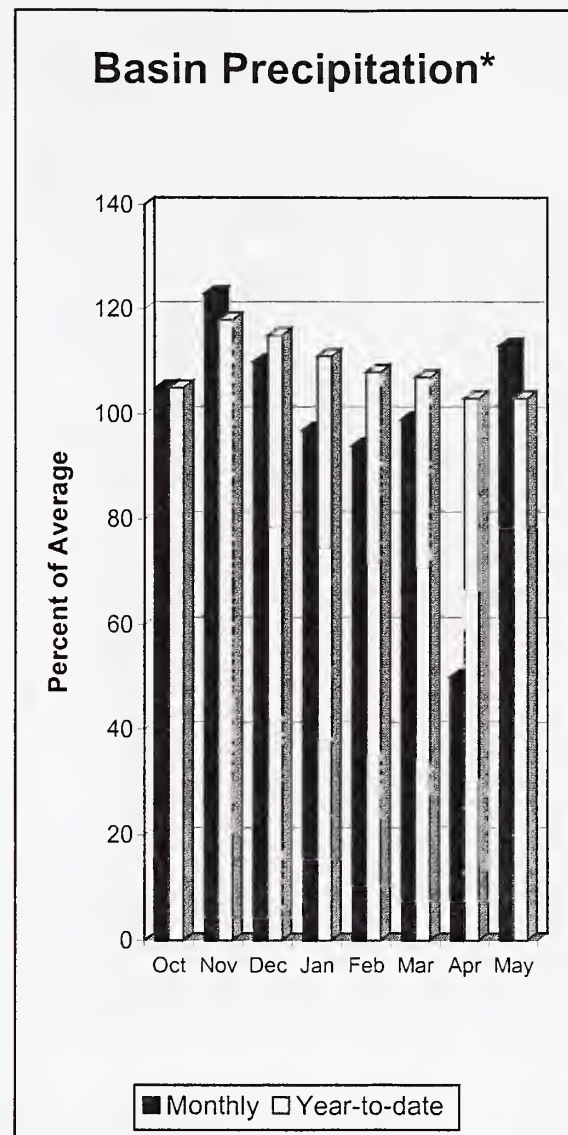
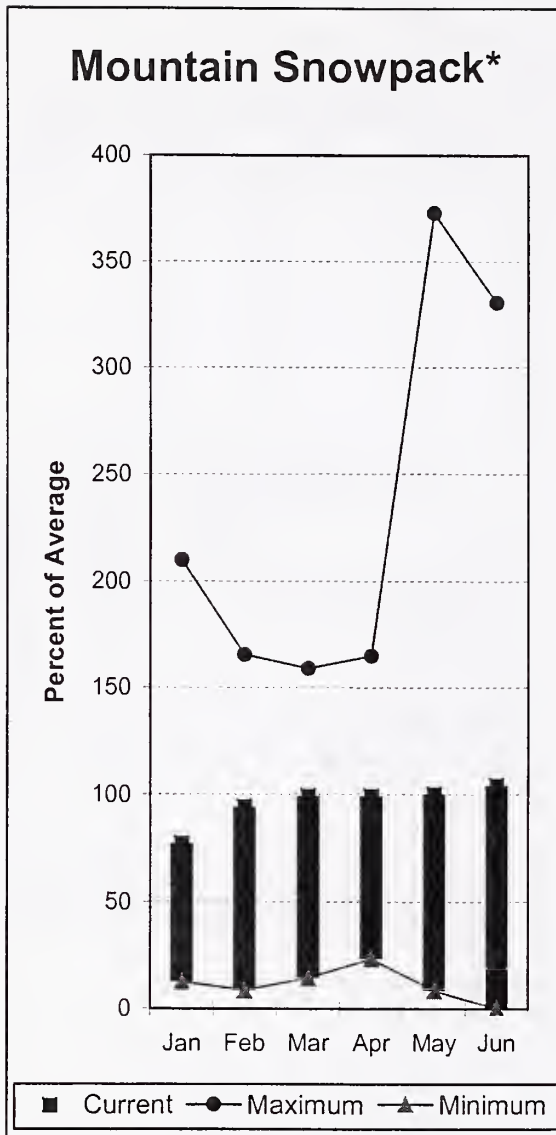
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OKANOGAN-METHOW BASIN Percent of Average June 1, 2000

Snowpack - 104%
 Precipitation - 89%
 Reservoir - 115%



Wenatchee - Chelan River Basins



*Based on selected stations

Precipitation during May was 113% of average in the basin and 103% for the year-to-date. All rivers and streams within the Wenatchee – Chelan river basin are forecast to have near to slightly above average flows for the upcoming June – September runoff period. May average streamflows on the Chelan River were 86% and on the Wenatchee River 92%. June 1 average snowpack in Wenatchee Basin was 94%, in Chelan Basin was 114%; Colockum Ridge, Stemilt Creek and the Entiat River snow survey sites have melted out for the season. Reservoir storage in Lake Chelan was 457,800-acre feet, 102% of June 1 average and 68% of capacity. Lyman Lake SNOTEL had the most snow water with 51.2 inches of water. This site would normally have 43.3 inches on June 1. Temperatures were near normal for May.

For more information contact your local Natural Resources Conservation Service office.

Wenatchee - Chelan River Basins

Streamflow Forecasts - June 1, 2000

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		=====		Chance Of Exceeding *		=====		
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
CHELAN RIVER near Chelan	JUN-SEP	557	653	718	97	783	879	738
	JUN-JUL	443	528	585	97	642	727	602
STEHEKIN near STEHEKIN	JUN-SEP	417	481	525	96	569	633	548
	JUN-JUL	317	369	405	96	441	493	422
ENTIAT RIVER near Ardenvoir	JUN-SEP	130	145	156	108	167	182	145
	JUN-SEP	130	145	156	108	167	182	145
WENATCHEE at Plain	JUN-JUL	477	543	588	98	633	699	600
	JUN-SEP	571	655	712	99	769	853	718
STEMILT nr Wenatchee (miners in)	MAY-SEP	99	126	144	104	162	189	138
CIRCLE CREEK near Leavenworth	JUN-SEP	176	200	216	109	232	256	198
	JUN-JUL	149	172	187	109	202	225	172

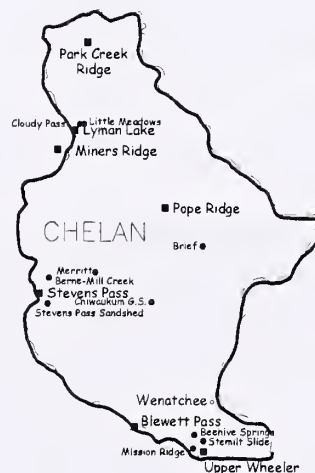
WENATCHEE - CHELAN RIVER BASINS Reservoir Storage (1000 AF) - End of May					WENATCHEE - CHELAN RIVER BASINS Watershed Snowpack Analysis - June 1, 2000			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
CHELAN LAKE	676.1	457.8	324.4	450.6	CHELAN LAKE BASIN	4	48	114
					ENTIAT RIVER	1	0	0
					WENATCHEE RIVER	7	38	94
					SQUILCHUCK CREEK	0	0	0
					STEMILT CREEK	1	0	0
					COLOCKUM CREEK	1	0	0

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

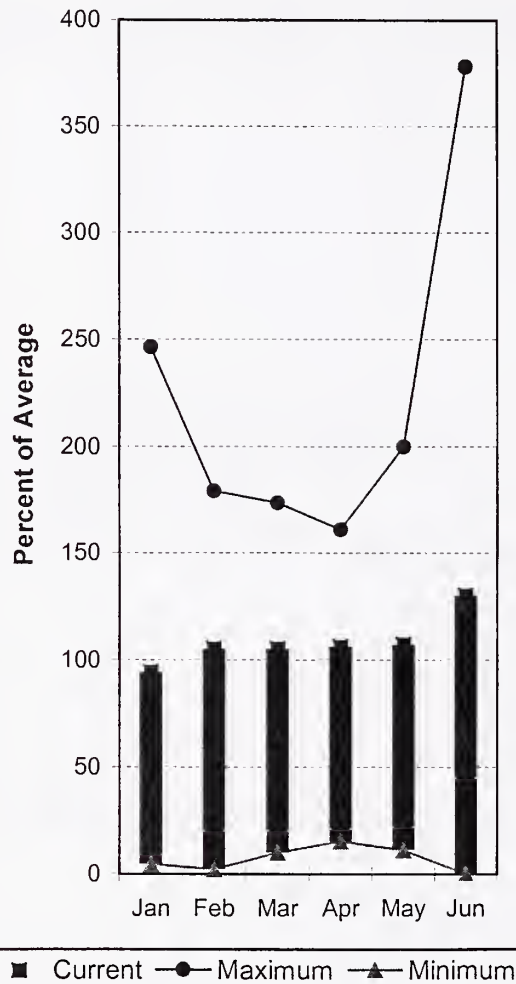
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- 2) - The value is natural flow - actual flow may be affected by upstream water management.

WENATCHEE-CHELAN BASIN
Percent of Average
June 1, 2000
Snowpack - 104%
Precipitation - 103%
Reservoir - 102%

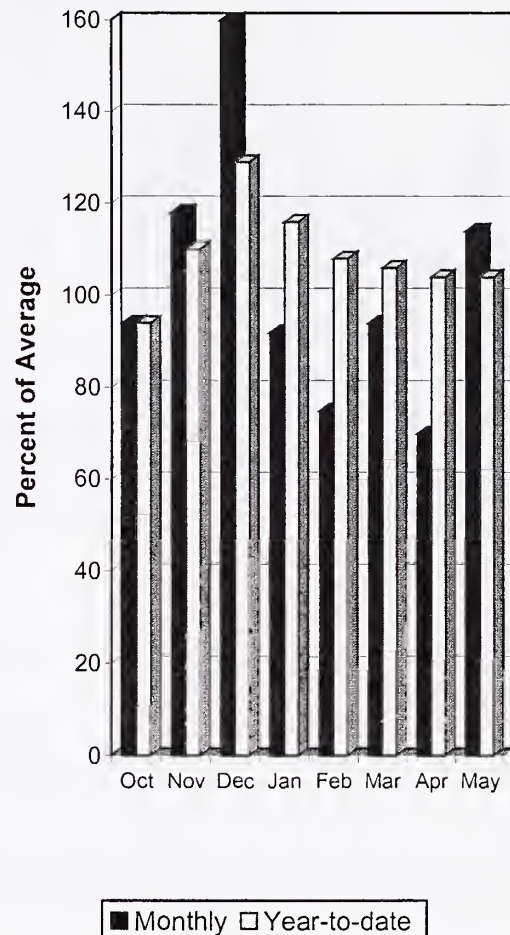


Upper Yakima River Basin

Mountain Snowpack*



Basin Precipitation*



*Based on selected stations

June 1 reservoir storage for the Upper Yakima reservoirs was 804,200-acre feet, 109% of average. Forecasts for the Yakima River at Cle Elum are 88% of average. Lake inflow forecasts include Keechelus at 89%, Kachess at 87% and Lake Cle Elum at 90% of average. A new forecast, developed for the Teanaway River near Cle Elum, is for 88% average flows. May streamflows within the basin were Yakima near Cle Elum at 100% and Cle Elum River near Roslyn at 98%. June 1 snowpack was 103% based upon six snow courses and SNOTEL readings within the Upper Yakima Basin. Precipitation was 114% of average for May and 104% year-to-date for water. Volume forecasts for the Yakima Basin are for natural flow. As such, they June differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

For more information contact your local Natural Resources Conservation Service office.

Upper Yakima River Basin

Streamflow Forecasts - June 1, 2000

		<----- Drier ----- Future Conditions ----- Wetter ----->						
Forecast Point	Forecast Period	===== Chance Of Exceeding * =====						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	

KEECHELUS LAKE INFLOW	JUN-JUL	30	39	45	88	51	61	51
	JUN-SEP	37	48	55	89	62	73	62

KACHESS LAKE INFLOW	JUN-JUL	27	34	39	87	44	51	45
	JUN-SEP	31	39	45	87	51	59	52

CLE ELUM LAKE INFLOW	JUN-JUL	140	164	181	90	198	222	201
	JUN-SEP	166	195	215	90	235	264	239

YAKIMA at Cle Elum	JUN-JUL	233	283	318	88	353	403	361
	JUN-SEP	291	350	390	88	430	489	444

TEANAWAY near Cle Elum	JUN-JUL	14.7	25	32	88	39	49	36
	JUN-SEP	18.6	29	36	88	42	52	40

UPPER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of May					UPPER YAKIMA RIVER BASIN Watershed Snowpack Analysis - June 1, 2000			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
KEECHELUS	157.8	131.5	102.3	144.0	UPPER YAKIMA RIVER	6	34	130
KACHESS	239.0	236.5	220.4	218.0				
CLE ELUM	436.9	436.2	329.3	378.0				

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

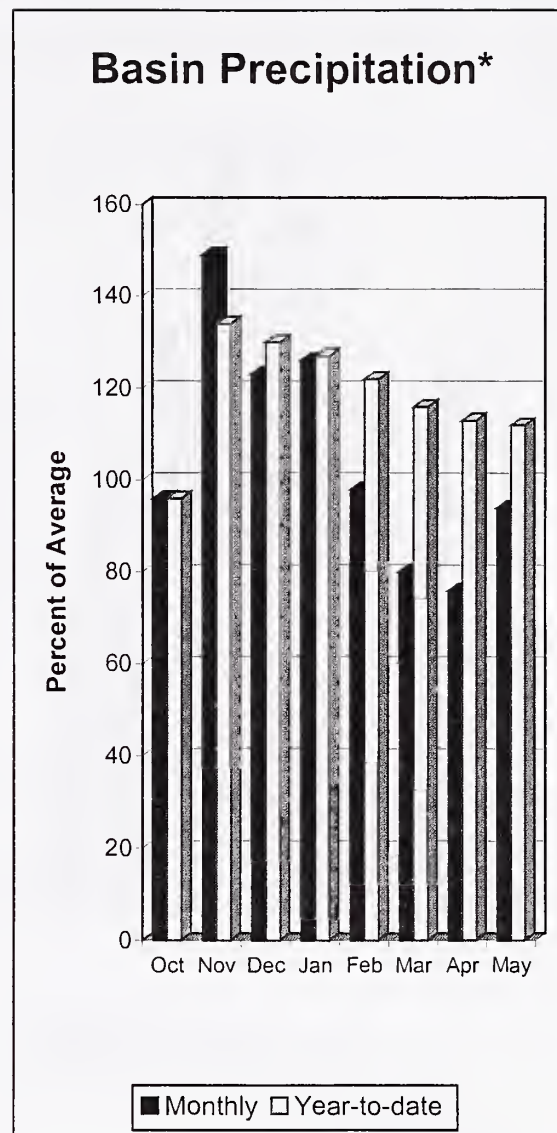
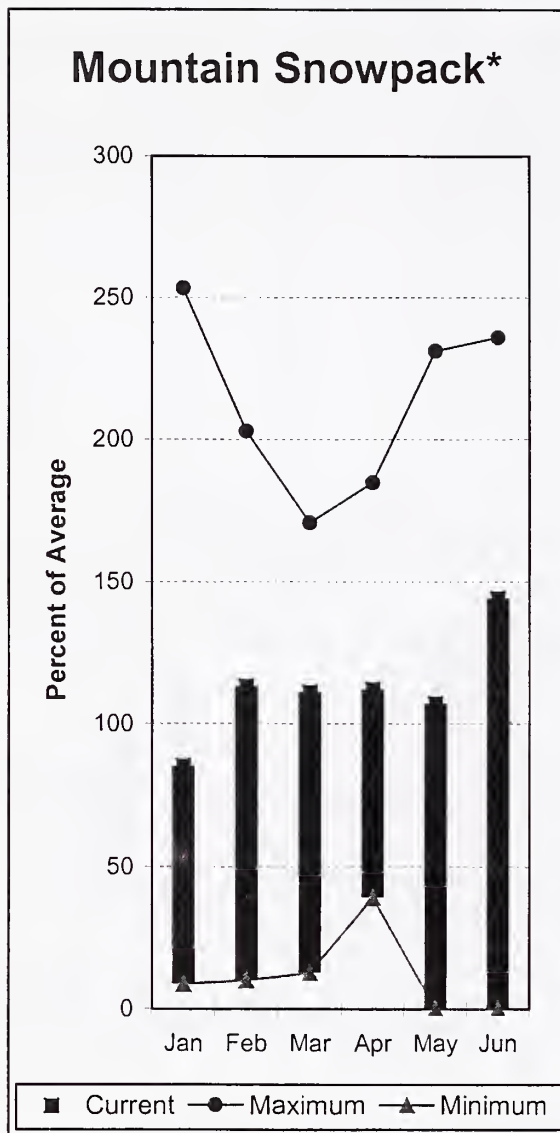
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UPPER YAKIMA BASIN
Percent of Average
June 1, 2000

Snowpack - 130%
Precipitation - 104%
Reservoir - 109%

Lower Yakima River Basin



*Based on selected stations

May average streamflows within the basin were: Yakima River near Parker, 90%; Naches River near Naches, 87%; and Yakima River at Kiona, 97%. June 1 reservoir storage for Bumping and Rimrock reservoirs was 227,800-acre feet, 117% of average. Forecast averages for Yakima River near Parker are 92%; American River near Nile, 87%; Ahtanum Creek, 95%; and Klickitat River near Glenwood, 123%. June 1 snowpack was 144% based upon five snow courses and SNOTEL readings within the Lower Yakima Basin. Precipitation was 94% of average for May and 112% year-to-date for water. Average temperatures for the month were near normal. Volume forecasts for Yakima Basin are for natural flow. As such, they June differ from the U.S. Bureau of Reclamation's forecast for the total water supply available, which includes irrigation return flow.

For more information contact your local Natural Resources Conservation Service office.

Lower Yakima River Basin

Streamflow Forecasts - June 1, 2000

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	Chance Of Exceeding * 50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
BUMPING LAKE INFLOW	JUN-SEP	46	59	68	88	77	90	77
	JUN-JUL	38	49	57	88	65	77	65
AMERICAN RIVER near Nile	JUN-SEP	44	52	57	87	62	69	65
	JUN-JUL	37	44	49	88	54	61	56
RIMROCK LAKE INFLOW	JUN-SEP	102	116	126	88	136	150	143
	JUN-JUL	73	84	92	88	100	111	105
NACHES near Naches	JUN-SEP	284	341	380	90	419	476	424
	JUN-JUL	235	282	314	91	346	393	347
AHTANUM CREEK nr Tampico (2)	MAY-SEP	28	33	36	95	39	45	38
	MAY-JUL	25	29	33	96	36	40	34
YAKIMA near Parker	JUN-SEP	625	765	860	92	955	1095	938
	JUN-JUL	487	602	680	91	758	873	749
KLICKITAT near Glenwood	JUN-JUN	38	44	48	123	52	58	39
	JUN-SEP	69	79	86	123	93	103	70

LOWER YAKIMA RIVER BASIN Reservoir Storage (1000 AF) - End of May

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
BUMPING LAKE	33.7	32.1	25.5	27.0
RIMROCK	198.0	195.7	152.1	167.0

LOWER YAKIMA RIVER BASIN Watershed Snowpack Analysis - June 1, 2000

Watershed	Number of Data Sites	This Year as % of Last Yr Average	
		Last Yr	Average
BUMPING LAKE			
RIMROCK			

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

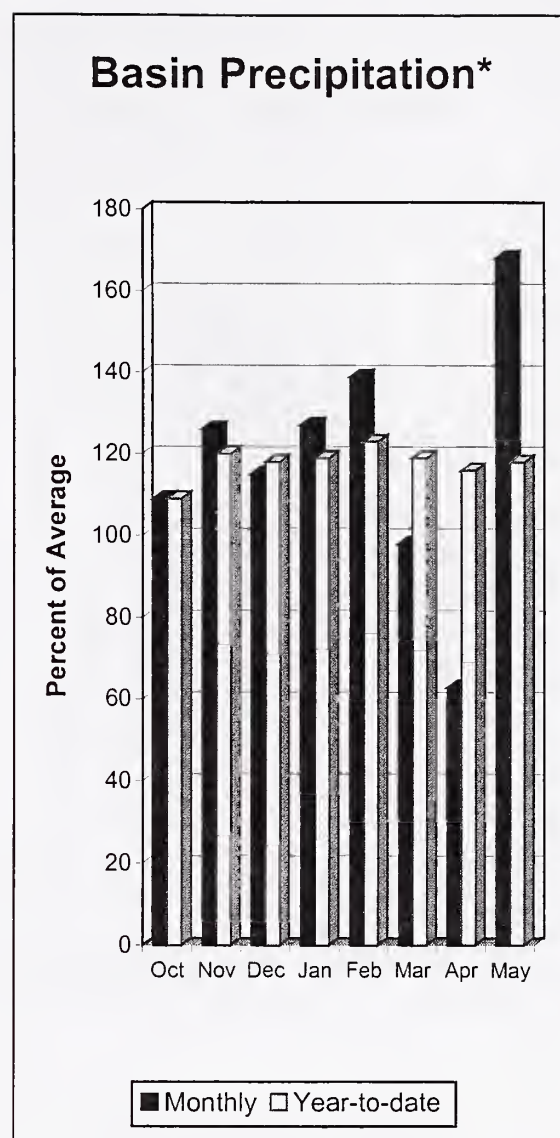
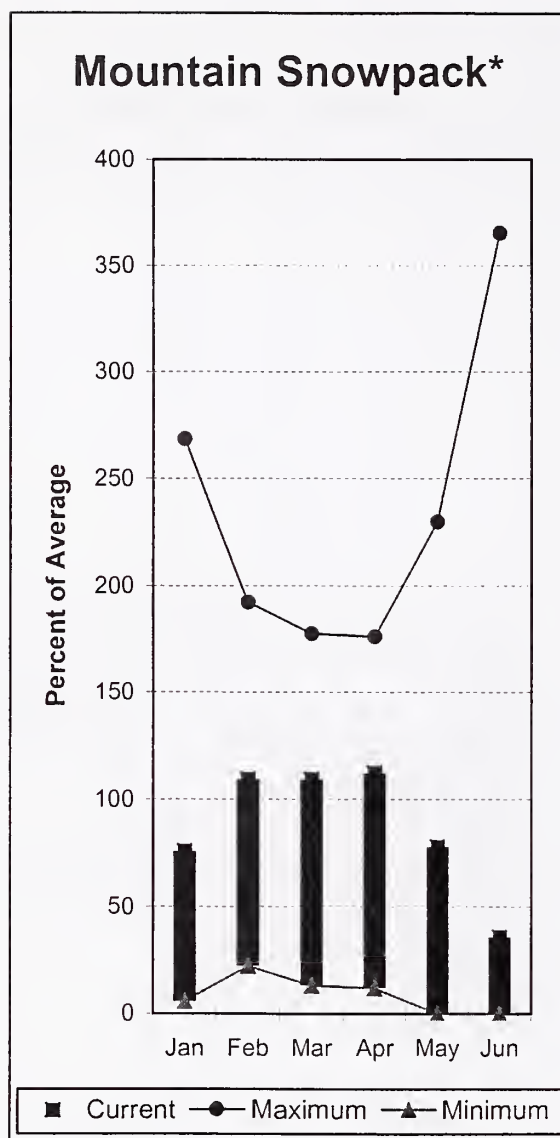
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LOWER YAKIMA BASIN Percent of Average June 1, 2000

Snowpack - 144%
 Precipitation - 112%
 Reservoir - 117%

Walla Walla River Basin



*Based on selected stations

May precipitation was 168% of average, bringing the year-to-date precipitation to 118% of average. June 1 average snowpack was at 36%. The forecast for the coming summer is for 100% of average streamflow in the South Fork Walla Walla River and 105% for Mill Creek. May streamflow was 81% of average for the Walla Walla River. The Touchet SNOTEL site had 1.3 inches of snow-water-equivalent. On average Touchet would be melted out. Average temperatures were near normal for the area.

For more information contact your local Natural Resources Conservation Service office.

Walla Walla River Basin

Streamflow Forecasts - June 1, 2000

Forecast Point	Forecast Period	<===== Drier ===== Future Conditions ===== Wetter =====>						
		=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
MILL CREEK at Walla Walla	MAY-SEP	4.72	6.61	7.90	105	9.19	11.08	7.50
	MAY-JUL	4.33	6.22	7.50	103	8.78	10.67	7.30
SF WALLA WALLA near Milton-Freewater	JUN-JUL	14.7	17.5	19.4	101	21	24	19.3
	JUN-SEP	26	30	33	100	35	39	33

WALLA WALLA RIVER BASIN
Reservoir Storage (1000 AF) - End of May

WALLA WALLA RIVER BASIN
Watershed Snowpack Analysis - June 1, 2000

Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					WALLA WALLA RIVER	2	15	450

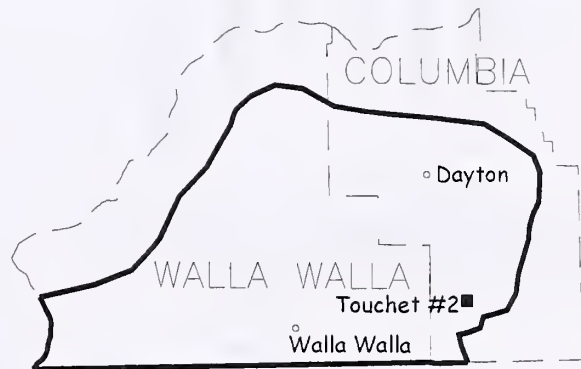
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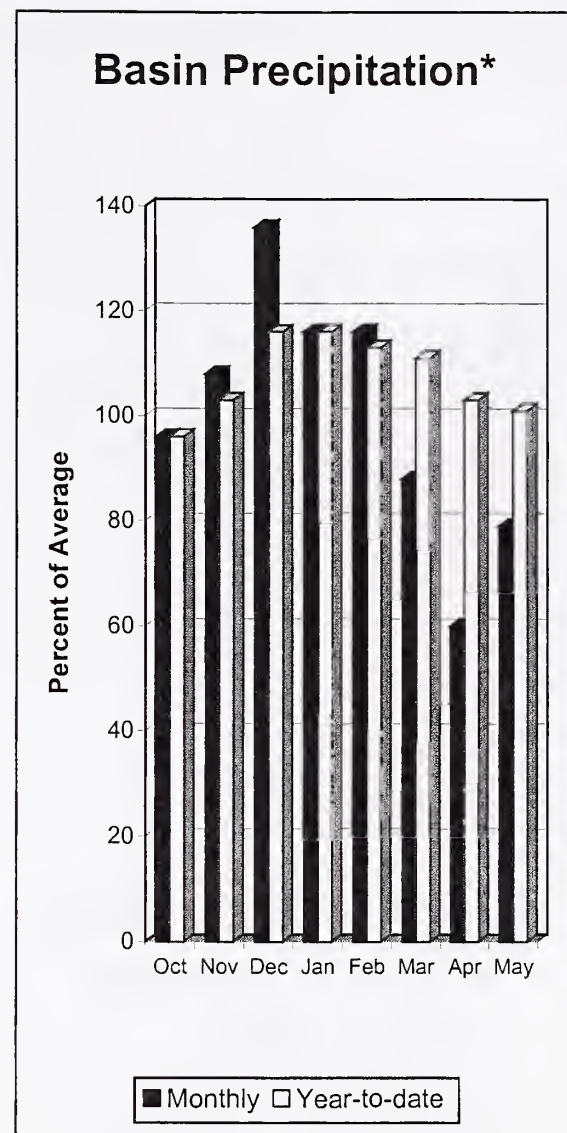
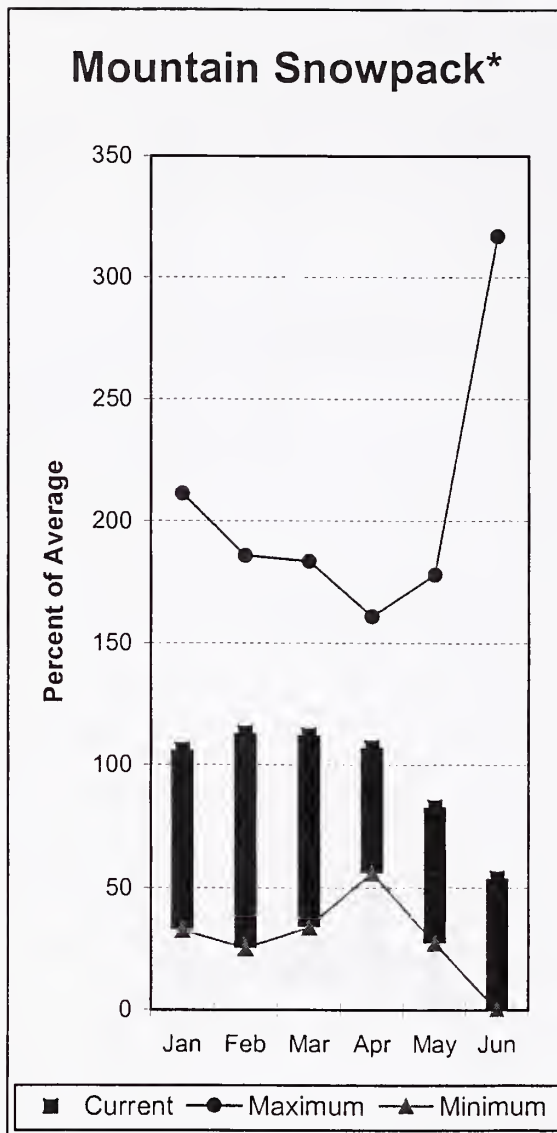
WALLA WALLA BASIN
Percent of Average
June 1, 2000

Snowpack - 36%
Precipitation - 118%



High Ridge ■

Lower Snake River Basin



*Based on selected stations

The June - September forecast is for 72% of average streamflow in the Snake River below Lower Granite Dam, 70% for Grande Ronde at Troy, and 77% for Clearwater River at Spalding. May precipitation was 79% of average, maintaining the year-to-date precipitation at 101% of average. June 1 snowpack was at 54% of average. May streamflow was 82% of average for Snake River below Lower Granite Dam and 83% for Grande Ronde River near Troy. Average temperatures were 1 degree above normal in the area for the month.

For more information contact your local Natural Resources Conservation Service office.

Lower Snake River Basin

Streamflow Forecasts - June 1, 2000

Forecast Point	Forecast Period	<----- Drier -----		Future Conditions		----- Wetter ----->		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
GRANDE RONDE at Troy (1)	JUN-JUL	196	285	326	70	367	456	466
	JUN-SEP	238	346	395	70	444	552	564
CLEARWATER at Spalding (1,2)	JUN-JUL	3360	4153	4514	76	4875	5668	5972
	JUN-SEP	3667	4516	4902	77	5288	6137	6405
SNAKE blw Lower Granite Dam (1,2)	JUN-JUL	4983	6095	6600	68	7105	8217	9678
	JUN-SEP	6907	8319	8960	72	9601	11013	12390

LOWER SNAKE RIVER BASIN Reservoir Storage (1000 AF) - End of May

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

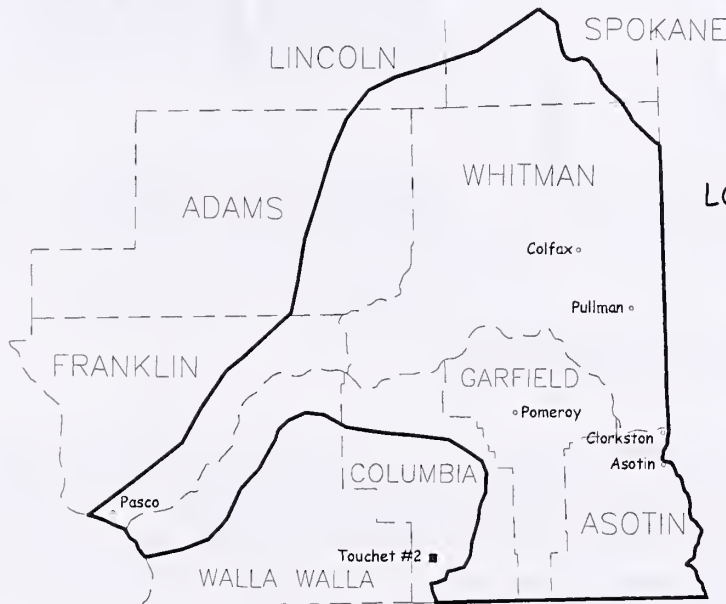
LOWER SNAKE RIVER BASIN Watershed Snowpack Analysis - June 1, 2000

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
LOWER SNAKE, GRANDE RONDE	9	20	35

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

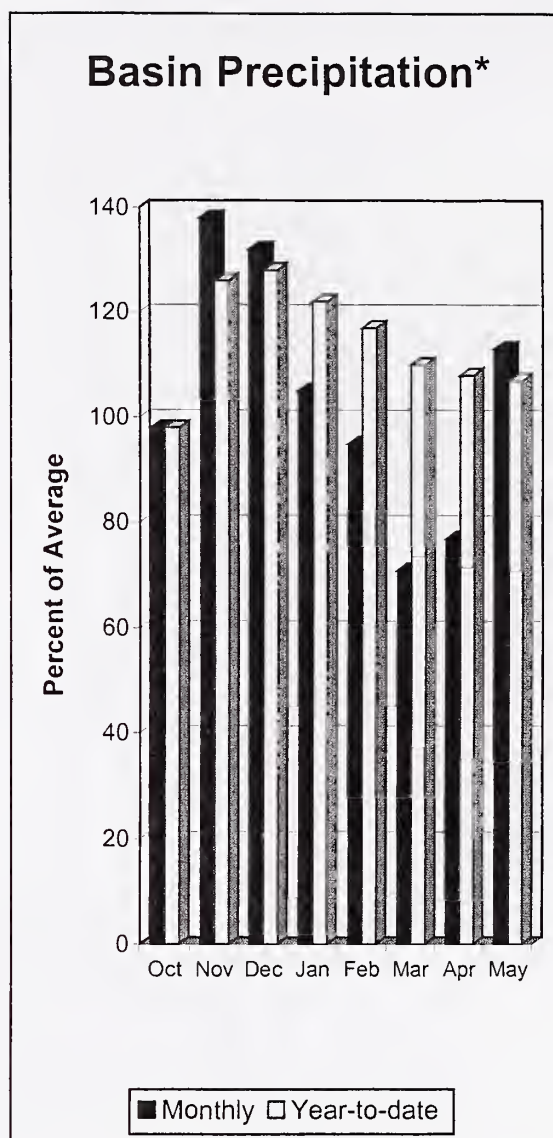
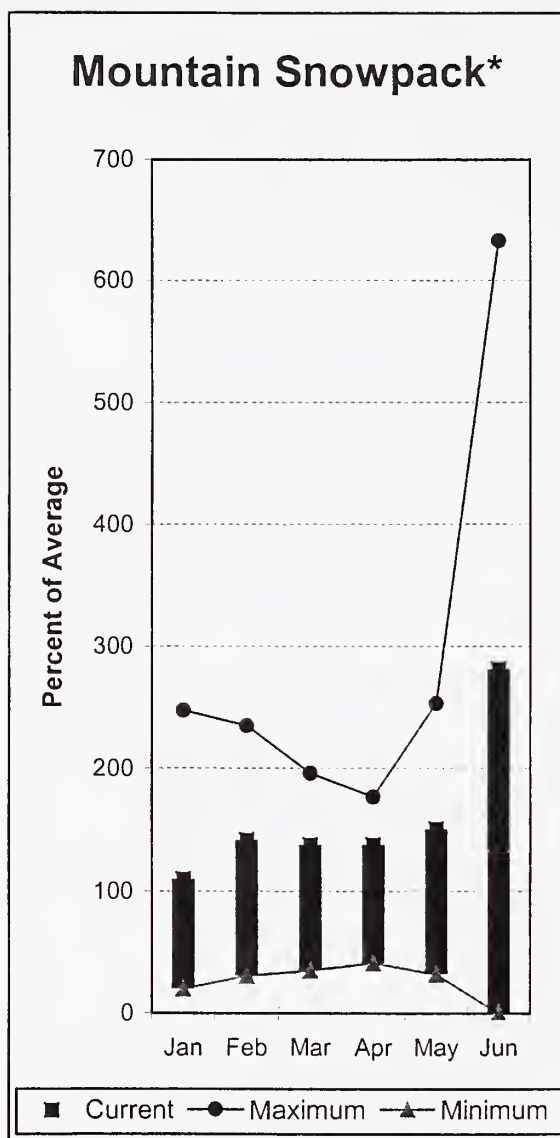
- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
 (2) - The value is natural flow - actual flow may be affected by upstream water management.



LOWER SNAKE RIVER BASIN Percent of Average June 1, 2000

Snowpack - 54%
Precipitation - 101%

Cowlitz - Lewis River Basins



*Based on selected stations

The June - September forecast is for 128% of average streamflow in the Lewis River at Ariel, 104% for Cowlitz below Mayfield Dam, and 123% for Klickitat River near Glenwood. May average streamflow for Cowlitz River was 92% and 224% for Lewis River. May precipitation was 113% of average and the water-year average was 107%. June 1 snow cover for Cowlitz River was 140%, and Lewis River was 422% of average. The Paradise Park SNOTEL recorded the most water content for the basin with 78.1 inches of water. Average June 1 water content is 48.1 inches. Average temperatures were 1 degree above normal during May.

For more information contact your local Natural Resources Conservation Service office.

Cowlitz - Lewis River Basins

Streamflow Forecasts - June 1, 2000

		<===== Drier ===== Future Conditions ===== Wetter =====>						
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
LEWIS at Ariel (2)	JUN-JUL	389	431	460	130	489	531	354
	JUN-SEP	561	612	647	128	682	733	506
COWLITZ R. bl Mayfield Dam (2)	JUN-SEP	240	704	1020	104	1336	1800	982
COWLITZ R. at Castle Rock (2)	JUN-SEP	273	867	1270	98	1673	2267	1299
KLICKITAT near Glenwood	JUN-JUN	38	44	48	123	52	58	39
	JUN-SEP	69	79	86	123	93	103	70
COLUMBIA R. at The Dalles (2)	JUN-SEP	43445	50266	54900	92	59534	66355	59652
	JUN-JUL	31344	37034	40900	90	44766	50456	45431

COWLITZ - LEWIS RIVER BASINS Reservoir Storage (1000 AF) - End of May

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

COWLITZ - LEWIS RIVER BASINS Watershed Snowpack Analysis - June 1, 2000

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
LEWIS RIVER	4	41	422
COWLITZ RIVER	6	48	140

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

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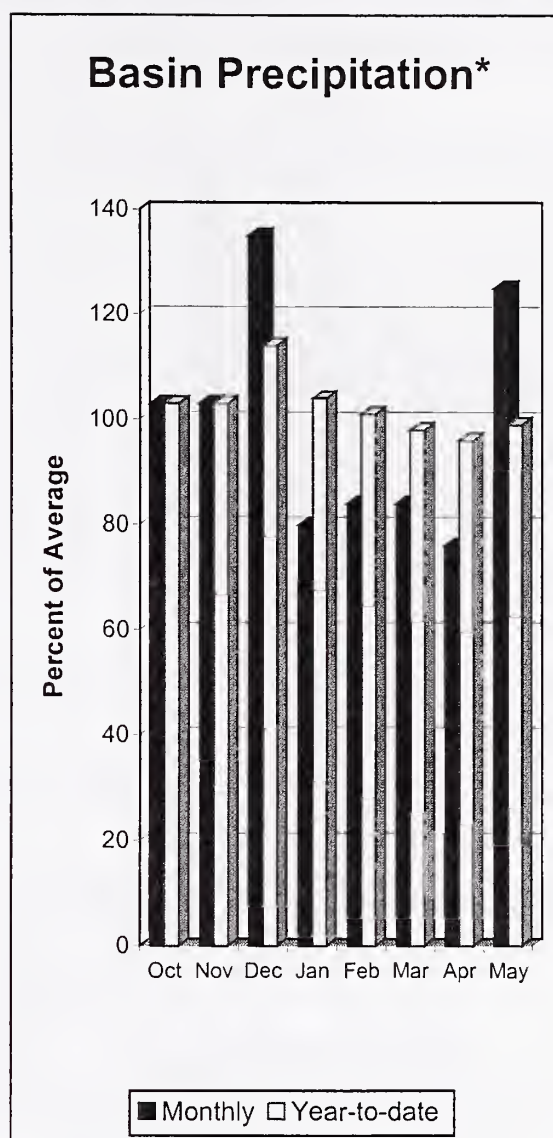
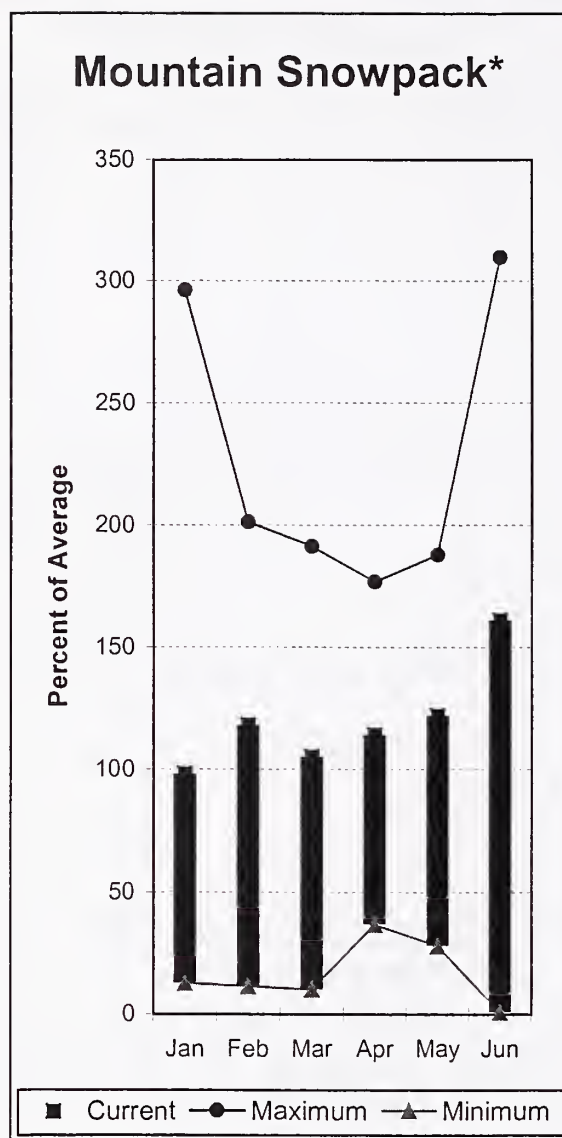
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COWLITZ-LEWIS BASIN Percent of Average June 1, 2000

Snowpack - 281%
Precipitation - 107%

White - Green – Puyallup River Basins



*Based on selected stations

Summer runoff is forecast to be 100% of average for the Green River below Howard Hanson Dam and 96% for the White River near Buckley. June 1 snowpack was 159% of average in both White River and Puyallup river basins and 165% in Green River Basin. Water content on June 1 at Corral Pass SNOTEL, at an elevation of 6,000 feet, was 28.8 inches. This site has a June 1 average of 19.5 inches. May precipitation was 125% of average, bringing the water year-to-date to 99% of average for the basins. Average temperatures in the area were near normal for the month.

For more information contact your local Natural Resources Conservation Service office.

White - Green - Puyallup River Basins

Streamflow Forecasts - June 1, 2000

Forecast Point	Forecast Period	<----- Drier ----- Future Conditions ----- Wetter ----->					
		90% (1000AF)		50% (Most Probable) (1000AF) (% AVG.)		30% (1000AF) 10% (1000AF)	
		70% (1000AF)	30-Yr Avg. (1000AF)				
WHITE near Buckley (1,2)	JUN-JUL	166	200	215	96	230	225
	JUN-SEP	244	287	307	96	327	320
GREEN below Howard Hanson (1,2)	JUN-JUL	49	69	78	100	87	78
	JUN-SEP	73	96	106	100	116	106

WHITE - GREEN - PUYALLUP RIVER BASINS Reservoir Storage (1000 AF) - End of May

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

WHITE - GREEN - PUYALLUP RIVER BASINS Watershed Snowpack Analysis - June 1, 2000

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
WHITE RIVER	2	46	159
GREEN RIVER	2	40	165
PUYALLUP RIVER	2	46	159

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

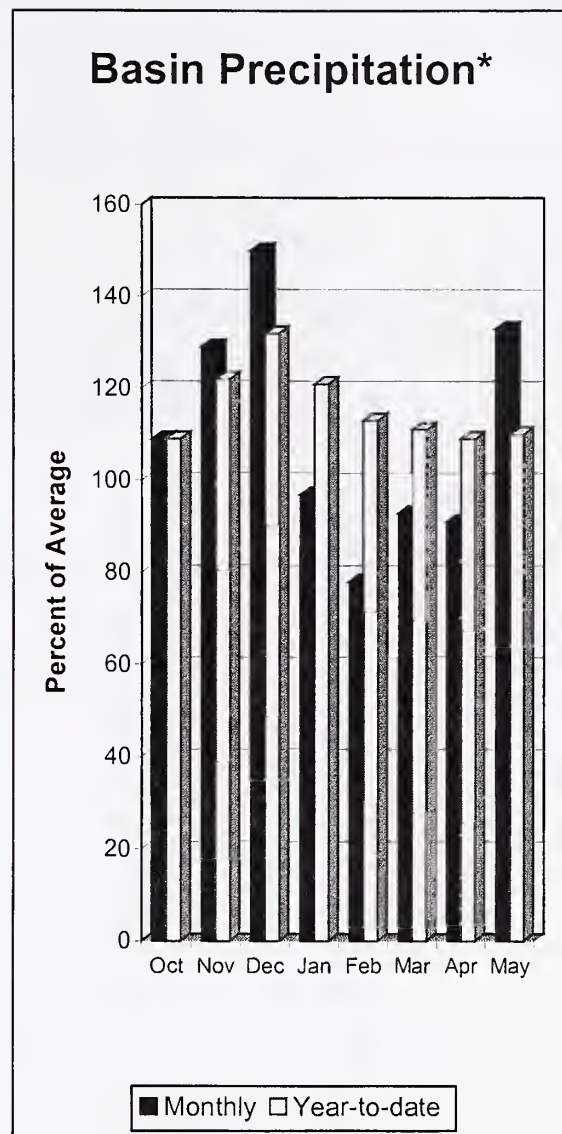
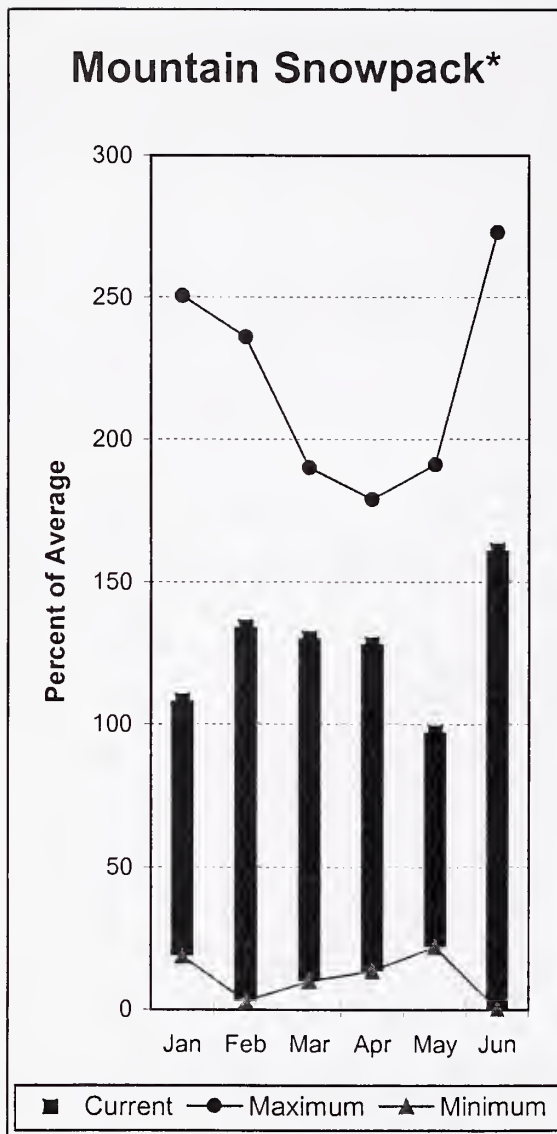
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WHITE-GREEN-PUYALLUP BASINS Percent of Average June 1, 2000

Snowpack - 161%
Precipitation - 99%

Central Puget Sound River Basins



*Based on selected stations

Forecast for spring and summer flows are: 94% for Cedar River near Cedar Falls; 92% for Rex River and 101% for South Fork Tolt. May precipitation was 133% of average, bringing water-year-to-date to 110% of average. June 1 average snow cover in Cedar River Basin was 170%, Tolt River Basin was 188%, Snoqualmie River Basin was 153%, and Skykomish River Basin was 141%. Stevens Pass SNOTEL, at 4070 feet, had 7.4 inches of water content. Average June 1 water content at Stevens Pass is 5.7 inches. Average temperatures were slightly above normal for the past month.

For more information contact your local Natural Resources Conservation Service office.

Central Puget Sound River Basins

Streamflow Forecasts - June 1, 2000

Forecast Point	Forecast Period	<----- Drier -----		Future Conditions -----		Wetter ----->		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF) (% AVG.)	Chance Of Exceeding *	30% (1000AF)	10% (1000AF)	
CEDAR near Cedar Falls	JUN-JUL	16.2	23	27	93	31	38	29
	JUN-SEP	21	29	35	94	40	48	37
REX near Cedar Falls	JUN-JUL	3.62	6.53	8.50	92	10.47	13.38	9.21
	JUN-SEP	5.3	8.9	11.3	92	13.7	17.3	12.3
CEDAR RIVER at Cedar Falls	JUN-JUL	11.1	15.8	19.0	91	22	27	21
	JUN-SEP	15.1	18.0	20	91	22	25	22
SOUTH FORK TOLT near Index	JUN-JUL	4.51	5.52	6.20	98	6.88	7.89	6.30
	JUN-SEP	7.19	8.27	9.00	101	9.73	10.81	8.90

CENTRAL PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of May

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg

CENTRAL PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - June 1, 2000

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
CEDAR RIVER	4	6	0
TOLT RIVER	2	63	188
SNOQUALMIE RIVER	4	52	153
SKYKOMISH RIVER	3	51	141

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

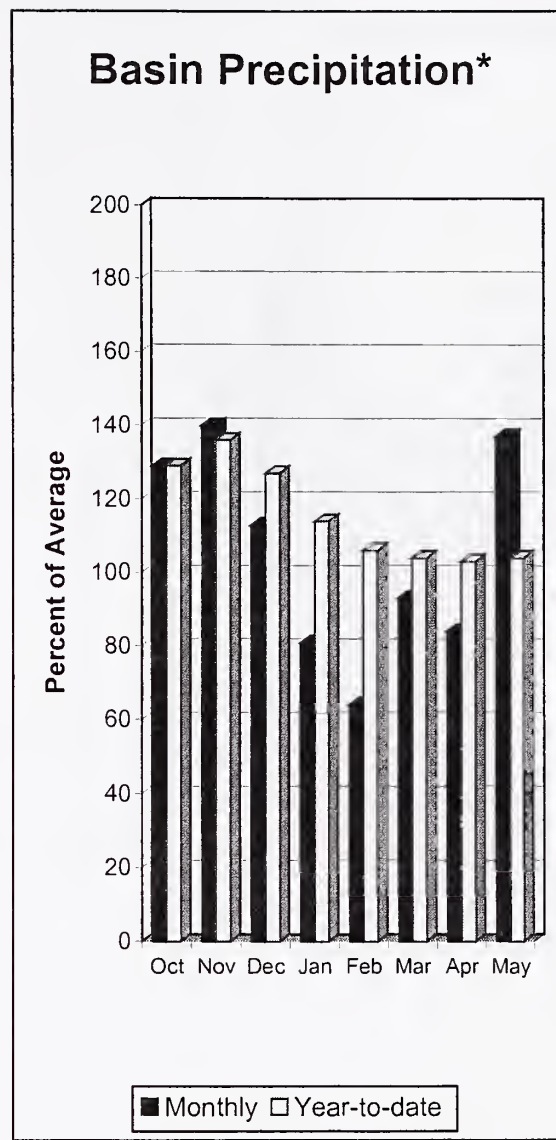
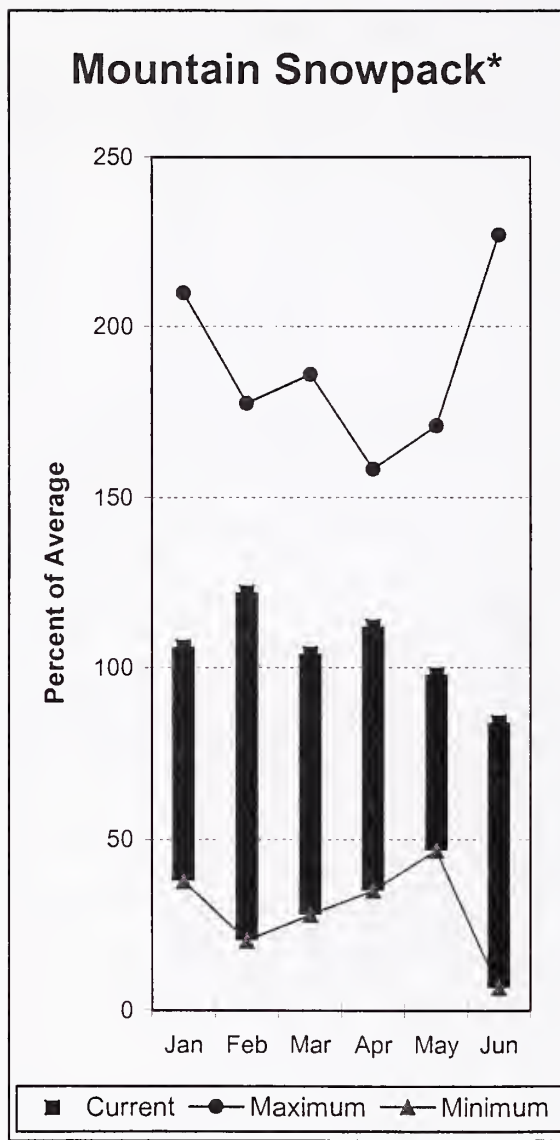
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 (2) - The value is natural flow - actual flow may be affected by upstream water management.

CENTRAL PUGET BASIN
Percent of Average
June 1, 2000
Snowpack - 161%
Precipitation - 110%



North Puget Sound River Basins



*Based on selected stations

Forecast for Skagit River streamflow is 87% of average for the spring and summer period. May streamflow in Skagit River was 96% of average. Other forecast points included Baker River at 97% and Thunder Creek at 92% of average. Basin-wide precipitation for May was 137% of average, bringing water-year-to-date to 104% of average. June 1 average snow cover in Skagit River Basin was 93%, and Nooksack River Basin was 75%. Rainy Pass SNOTEL, at 4,780 feet, had 18 inches of water content. Average June 1 water content is 20.4 inches. June 1, Skagit River, reservoir storage was 95% of average and 71% of capacity. Average May temperatures were slightly below normal for the basin.

For more information contact your local Natural Resources Conservation Service office.

North Puget Sound River Basins

Streamflow Forecasts - June 1, 2000

Forecast Point	Forecast Period	<<===== Drier =====>>>>		Future Conditions		<===== Wetter =====>>>>		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
THUNDER CREEK near Newhalem	JUN-JUL	123	136	145	91	154	167	160
	JUN-SEP	210	227	239	92	251	268	259
SKAGIT at Newhalem (2)	JUN-SEP	1054	1160	1231	87	1302	1408	1418
BAKER RIVER near Concrete	JUN-JUL	428	456	475	97	494	522	490
	JUN-SEP	668	684	695	97	706	722	717

NORTH PUGET SOUND RIVER BASINS Reservoir Storage (1000 AF) - End of May

Reservoir	Usable Capacity	*** Usable Storage ***		
		This Year	Last Year	Avg
ROSS	1404.1	975.0	590.2	1033.9
DIABLO RESERVOIR	90.6	87.1	87.5	86.1
GORGE RESERVOIR	9.8	8.1	7.8	8.3

NORTH PUGET SOUND RIVER BASINS Watershed Snowpack Analysis - June 1, 2000

Watershed	Number of Data Sites	This Year as % of	
		Last Yr	Average
SKAGIT RIVER	4	39	93
BAKER RIVER	0	0	0
NOOKSACK RIVER	2	25	75

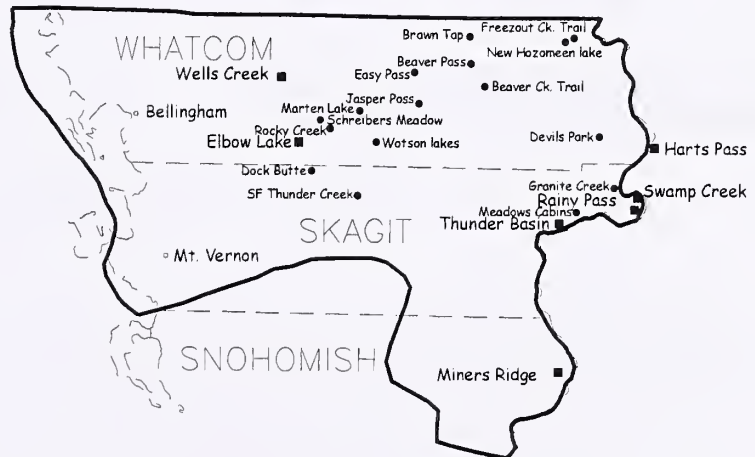
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The average is computed for the 1961-1990 base period.

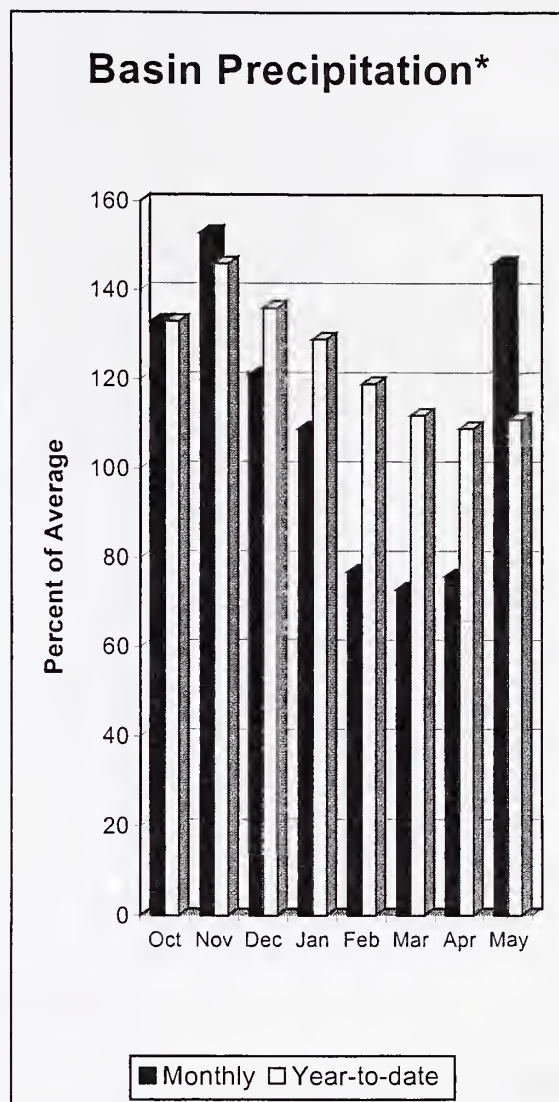
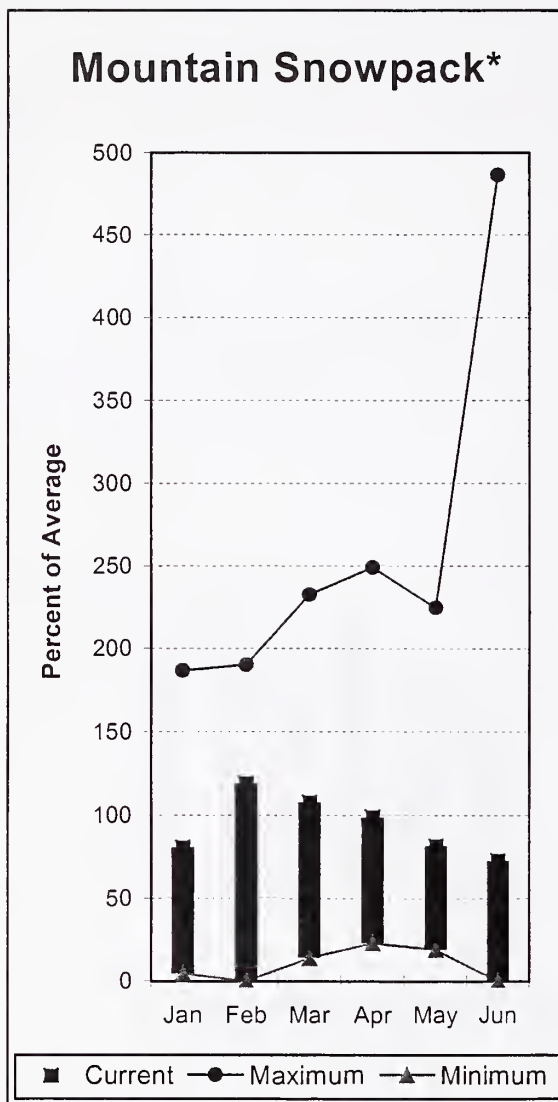
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NORTH PUGET BASIN Percent of Average June 1, 2000

Snowpack - 84%
 Precipitation - 104%
 Reservoir - 95%



Olympic Peninsula River Basins



*Based on selected stations

June average streamflow forecasts for Dungeness River is 98% and Elwah River is 93%. Big Quilcene and Wynoochee rivers can expect near average runoff this summer also. May precipitation was 146% of average. Precipitation has accumulated at 111% of average for the water-year. May precipitation at Quillayute was 9.32 inches. The thirty-year average for May is 5.27 inches. June 1 snow cover in the Olympic Basin was at 73% of average. The Mount Crag SNOTEL near Quilcene had 1.6 inches of snow-water-equivalent on June 1. This site is typically melted out by June 1. Temperatures were 1 degree below average for the month.

For more information contact your local Natural Resources Conservation Service office.

Olympic Peninsula River Basins

Streamflow Forecasts - June 1, 2000

		<<===== Drier =====		Future Conditions		===== Wetter =====>		
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (Most Probable) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
=====								
DUNGENESS near Sequim	JUN-SEP	88	95	100	98	105	112	102
	JUN-JUL	65	70	73	99	76	81	74
=====								
ELWHA near Port Angeles	JUN-SEP	262	283	297	93	311	332	319
	JUN-JUL	193	209	220	94	231	247	233

OLYMPIC PENINSULA RIVER BASINS Reservoir Storage (1000 AF) - End of May					OLYMPIC PENINSULA RIVER BASINS Watershed Snowpack Analysis - June 1, 2000			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Average
					OLYMPIC PENINSULA	1	9	0
					ELWHA RIVER	0	0	0
					MORSE CREEK	0	0	0
					DUNGENESS RIVER	0	0	0
					QUILCENE RIVER	1	16	0
					WYNOOCHEE RIVER	0	0	0

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

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OLYMPIC PENINSULA BASIN
 Percent of Average
 June 1, 2000
 Snowpack - 73%
 Precipitation - 111%



GLACIER PAGE

North Cascades National Park

Glacier Monitoring Program

The National Park Service began monitoring glaciers in North Cascades National Park in 1993. Goals for this program and additional data can be found at North Cascades National Park home page at <http://www.nps.gov/noca/massbalance.htm>.

The four glaciers monitored are located at the headwaters of four park watersheds with large hydroelectric operations (Figure 1). They represent a range in elevation from 8500 to 5700 feet, and a range in climatic conditions from maritime to continental. Methods include at least two visits annually to each glacier to measure winter accumulation and summer melt. Measurements are taken at a series of points down the centerline of each glacier (Table 1), then integrated across the entire glacier surface to determine annual mass balance for the entire glacier. Glaciers east of the hydrologic crest (Silver and Sandalee) appear to have a different relationship to climate than the west-side glaciers due to their higher elevations, continental climate and north aspects (Figure 2). Temporal variation is also large, as net mass balance varied 11.5 ft/yr. between 1993 and 1999.

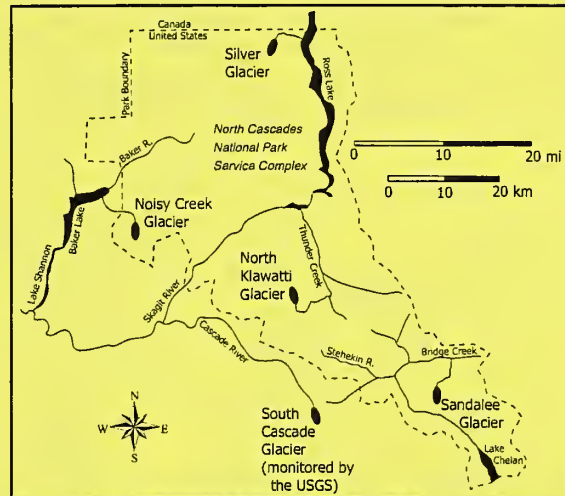


Figure 1. Glaciers monitored in North Cascades N.P.S. Complex.

Glacier:	Elev. (feet)	2000 Accumulation (inches W.E.)	1999 Accumulation (inches W.E.)	Average Accumulation (inches W.E.)
Noisy Creek	6100	127	214	141
	6030	150	190	138
	5940	121	165	122
	5810	117	167	120
	5670	118	171	119
Silver	8530	134	189	133
	8200	98	141	115
	7690	169	164	131
	7400	62	63	63
North Klawatti	7710	122	182	129
	7360	130	191	127
	7040	135	167	126
	6460	126	168	110
	6130	113	130	99
Sandalee	7360	113	153	128
	7100	131	185	143
	6810	129	152	127
	6630	150	214	150

Table 1. Snow water equivalent (W.E.) measured at monitored glaciers in late April.

Table 1 presents this spring's winter accumulation data, along with average values and data from the heavy winter accumulation of water year 1999 for comparison. Accumulation generally increases with elevation, but on steep, barren slopes snow is redistributed by wind and avalanches. This year's accumulation values are slightly below the seven-year average.

Estimates of total glacial contribution to runoff for three watersheds are based on the mass balance measurements and GIS analysis to determine glacier area by 165 ft elevation bands (Table 2). Glaciers buffer flow in these watersheds by providing meltwater from ice in dry/warm years, and by storing water in wet/cool years. Glacial stream buffering capacity in these watersheds varies by as much as 100% annually. Magnitude of glacial contribution to streamflow is large, but varies by the amount of glacial cover in each watershed. Thunder Creek is 13% glaciated, while Baker River and Stehekin River are 6% and 3%, respectively (Post and others, 1971).

Relative importance of glacial contribution to streamflow increases from west to east. For example, glaciers annually contribute a higher percentage of meltwater to streamflow in the Stehekin than in the Baker, despite the fact that the Baker is more glaciated. This is due to lower snowfall east of the hydrologic crest of the North Cascades. In this average accumulation year we anticipate that glacial runoff will be above average in these watersheds.

	Mean Glacial Runoff	Range of Glacial Runoff		Percent Glacial Runoff to Total Summer Runoff	
		Minimum	Maximum	Minimum	Maximum
Noisy Creek Glacier	1.6	1.3	2.1		
Baker River Watershed	76	70	93	7	14
North Klawatti Glacier	4.1	3.2	5.1		
Thunder Creek Watershed	105	86	135	25	44
Sandalee Glacier	0.5	0.3	0.6		
Stehekin River Watershed	71	58	91	6	10

Table 2. Glacial contribution to summer stream flow for three watersheds. Runoff units are thousands of acre-feet. Data from 1993-99 except the Sandalee Glacier and Stehekin River Watershed (1995-99).

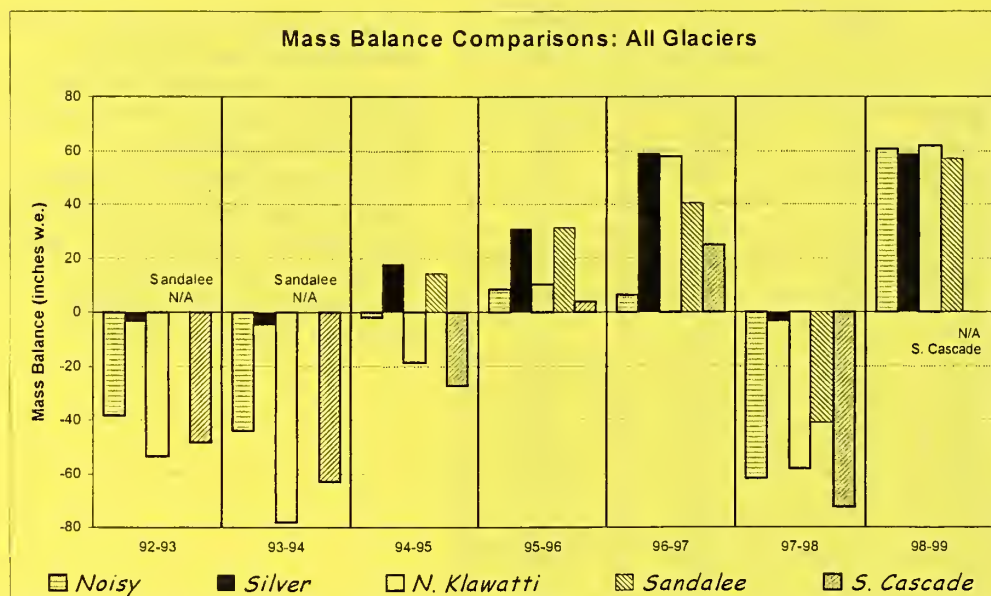


Figure 2. Net annual mass balance for the five glaciers monitored in the North Cascades.

Issued by

Pearlie S. Reed
Chief
Natural Resources Conservation Service
U.S. Department of Agriculture

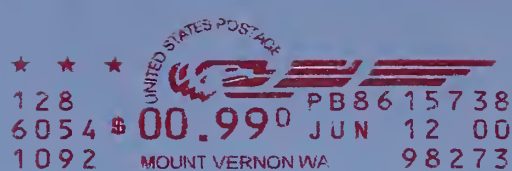
Released by

Leonard Jordan
State Conservationist
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The Following Organizations Cooperate with the Natural Resources Conservation Service in Snow Survey Work*:

Canada	Ministry of the Environment Investigations Branch, Victoria, British Columbia
State	Washington State Department of Ecology Washington State Department of Natural Resources
Federal	Department of the Army Corps of Engineers U.S. Department of Agriculture Forest Service U.S. Department of Commerce NOAA, National Weather Service U.S. Department of Interior Bonneville Power Administration Bureau of Reclamation Geological Survey National Park Service Bureau of Indian Affairs
Local	City of Tacoma City of Seattle Chelan County P.U.D. Pacific Power and Light Company Puget Sound Power and Light Company Washington Water Power Company Snohomish County P.U.D. Colville Confederated Tribes Spokane County Yakama Indian Nation Whatcom County Pierce County
Private	Okanogan Irrigation District Wenatchee Heights Irrigation District Newman Lake Homeowners Association Whitestone Reclamation District

*Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.



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